June 1980
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Cover: B-29A Superfortress *Hawg Wild* en-route from Mildenhall to Duxford on 2 March 1980 during its last flight (an article and further pictures of this aircraft appear on pages 262–267 of this issue — *Ed*). *Photo: Jeremy K. Flack*

Frontispiece: Partenavia P68B Victor, G-BHBZ, parked on the general aviation apron at Gatwick on 14 March 1980 and . . .

This picture: . . . another view of the twin-engined light transport. Although the P68B variant seen here has a fixed undercarriage, the design range includes the P68R version with a retractable undercarriage. *Photos: Allan Burney*

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airscan

Paul Humphreys

AS ANY REALLY dedicated *Airscan* fan will know, your man is as a ship without a rudder in the field of aerospace electrics. Not that one often sees a ship in a field — but you'll grasp the analogy without doubt. Yes, when it goes beyond the amps × ohms = volts bit, it's all just electrickery. Hydraulics? OK. Pneumatics? OK. Mechanics? Sure ground. Fibre optics? Y-e-s — probably. But electrics and electronics? No way. Your correspondent is lost, *nescient*, *non est*, clueless.

Fortunately, at Lockheed — Georgia there are some switched on guys who are studying the practical possibilities of replacing the existing hydraulic and pneumatic systems in what is described as 'a medium transport', with electrical systems. The object of this latest display of electrickery is cost cutting and adding lightness. Lockheed claims that such an aeroplane would be cheaper to build and operate and easier to maintain than your conventional kite with oil and air coursing through its piped-up airframe. Power would come from engine-driven electric generators turning motors which would open doors, operate cabin pressurisation systems, function the landing gear, the flying control units and secondary flight control surfaces. Another major advantage of the elimination of the hydraulic system is the reduction of fire risk in the aircraft. And with the pneumatic system out of the way there would be less risk of an explosion which can occur when grease gums up the pneumatic works.

In the face of all these undoubted selling points for the all-electric aeroplane, there is a small cloud which seems to cast a shadow on the plan. The shadow is EMP. That's electro-magnetic pulse. It's the 'thing' generated by a nuclear explosion which will knock-out electrical systems and installations over a vast area centred on ground zero. Shielding can reduce the risk of EMP damage, but if an aircraft has to lug this around as well, aren't we back to square one weight-wise?

. . . and then again

Talking of all-electric aeroplanes brings back to mind the letter written by the inevitable small Dutch boy to a British aircraft manufacturer way back in 1949: 'Will you please send me a picture of your wonderful English Electric A1 bomber'. And for anyone not yet 31 years old, he was writing about the prototype of the Canberra — examples of which still fly in Royal Air Force service, hydraulics, pneumatics, *et al.*

Dextrous digits

'Plus cela change, plus cela est la même chose' as you are, no doubt saying all the time. And you're correct, for the more things change, the more they remain unchanged. Or do they?

This was brought to mind only recently when I was reading the sales pitch for the 1919 Deperdussin B2 80hp Gnome rotary engined single-seat monoplane, then being offered for sale in Britain for around £950. It was claimed that this 'Dep' could be flown with two fingers, so light and positive were the controls. And lateral control was achieved by wing warping, too!

Some 60 years on, the pilot of the McDonnell Douglas F-18 Hornet must also use his fingers to fly his aircraft. But he requires all eight fingers plus a pair of thumbs. Both the Hornet's throttles and the control column handle are liberally studded with switches, levers, push buttons and triggers. On the throttles there are eleven such mini-controls and there are seven on the stick. Between them they have 42 different positions controlling afterburning, communications, airbrakes, gun or missile firing, auto-pilot and auto-throttle, nosewheel steering, pitch and roll trim, chaff or flare dispensing . . . you name it.

Surprised? You shouldn't be because the Hornet was specified by the US Navy to replace the ageing Corsairs and Phantoms. It was intended to reduce the number of aircraft types employed by the USN for the carrier-fighter/light-medium attack/reconnaissance rôles from three or four down to one. Hence the fistfuls of controls which the 'general purpose' F-18 pilot has at his finger-tips.

One recalls that, between the wars, the GP aircraft was the OK RAF aeroplane. It was a low cost, all-singing all-dancing type to meet the secondary requirements of what was then the 'best flying club in the world'. So often it mopped up surplus components and equipment held in store and was quite an effective type of aeroplane. The Wapiti, the 'Ninack' the Hardy all spring to mind as examples of the GP line. All quite useful but none a shining example of all-round operational effectiveness. Today the GP aeroplane is a purpose-built missile-with-a-man-in-it, able to perform in its various collective rôles as effectively as several specialist aeroplanes put together. *'Plus cele change, plus cela n'est pas la même chose'* — at least according to McDonnell Douglas.

Thiefrow

Remember to keep your hand on your halfpenny when you progress through London Airport-Heathrow — or 'Thiefrow' as it is known to some. Not strictly true, of course, because individual passengers are not likely to be ripped off in the concourse. Much more vulnerable are the mountains of passenger luggage en-route from terminals to aircraft. Sounds a bit melodramatic? Last year the value of reported thefts from luggage was more than £1¼ million, and it's reckoned that this figure should have been doubled to obtain the true value. Add to this the value of cargo thefts, which totalled some £400,000, and there's a grand haul of something approaching £2 million for the gangs of thieves who operate at the airport. That's fact, not melodrama.

Their methods are simple. As your luggage is loaded a likely looking case — well strapped, locked and of hide, is quickly slashed open with a sharp knife. A practiced hand rifles through the contents and away goes the jewellery, the electric appliances and other easily sold and attractive items. In the cargo sheds the same technique applies to Royal Mail bags, only there the haul may be diamonds, travellers' cheques, currency or watches.

There are few arrests as there is little hope of discovering who loaded or handled your luggage, or the mail bags, once the hold is closed and the aircraft has taxied off its stand. So, this summer and, indeed, at all seasons, use your oldest luggage, don't stash the family diamonds on top of your shirts and don't have one of those fancy swing labels advertising the fact that you're the Sales Director of the XYZ Jewellery Co. Good travelling.

Above: The third production Tornado to fly, BT002 (ZA320), seen here in afterburner during a take-off at BAe Warton in late-February — BT002 is to be the first aircraft delivered to the TTTE at RAF Cottesmore. *Photo: Colin Walker*

airnews

Tornado progress report

BS001, the first production strike Tornado, made its first flight on 14 March 1980 at BAe's Warton aerodrome flown by Jerry Lee, Warton Division's Deputy Chief Test Pilot with Ray Woollett, Chief Navigator, in the rear cockpit. During the flight, which lasted 1hr 45min, the aircraft exceeded the speed of sound at medium altitude. The aircraft is the fourth production Tornado to have flown, the other three being dual-control trainers BT001 and BT002 in the UK and GT001 in Germany; apart from dual controls and minor differences in the navigator's equipment, the trainer Tornadoes are identical to the strike aircraft and possess full operational capability.

● During 1980, more production aircraft will roll off the assembly lines in the three partner countries and the first of several Tornadoes to be delivered to the Tri-national Tornado Training Establishment (TTTE) at RAF Cottesmore this year, will be BT002 during the summer. BT001 joined pre-series aircraft 12 and 15 at the A&AEE Boscombe Down last November and GT001 was scheduled to have joined pre-series aircraft 11 at the German Government's Test Centre at Manching in the spring. Pre-series aircraft 13 and 14 are due to go respectively to Manching and the Italian Government's Test Centre at Pratica di Mare at the end of this year.

● Tri-nationally integrated operational trials at the Panavia and Government test centres have made much progress in recent months and these include:-

Prototypes	s/nos	Notes
01 (FRG)	D-9591	Production engine assessment
02 (UK)	XX946	High incidence trials
03 (UK)	XX947	Rapid rolling with heavy stores: flight testing the buddy-buddy refuelling system
04 (FRG)	D-9592	Navigation and ground mapping: autopilot testing
05 (IT)	X-586	Load surveys with stores
06 (UK)	XX948	Mauser gun firing
07 (FRG)	98+06	Terrain-following: autopilot testing
09 (IT)	X-587	Firing and jettisoning Kormoran: weapon release and hot weather trials
Pre-series aircraft		
11 (FRG)	98+01	Engine handling at OTC Manching
12 (UK)	XZ630	Weapon release assessment at OTC Boscombe Down
13 (FRG)	98+02	MW1 (Multi-purpose weapon) and supersonic handling trials
14 (IT)	X-588	Production wing flutter: production systems: Italian ECM
15 (UK)	XZ631	Supersonic flutter: refuelling trials (now at OTC Boscombe Down)
16 (FRG)	98+03	MW1 and Mauser testing
Production aircraft		
BT001	ZA319	At OTC Boscombe Down
GT001	40+01	Shortly to be delivered to OTC Manching
BT002	ZA320	First aircraft to be delivered to TTTE Cottesmore, Summer 1980
BS001	ZA321	Maiden flight on 14 March 1980
GT002	40+02	Maiden flight on 31 March 1980

● The second German Tornado production aircraft, GT002, made its maiden flight on 31 March 1980 at the Messerschmitt-Bolkow-Blohm flight test centre at Manching near Munich. GT002 will be involved in the tri-national Tornado instructor training which will start shortly at Manching and will subsequently be delivered to the TTTE at RAF Cottesmore.

● The first prototype of the Tornado Air Defence Variant, A01 s/n ZA254, completed more than 41hr flying by the end of January when it went on lay-up for the installation of updated equipment. The aircraft made its first flight on 27 October 1979 and effectively cleared its initial flight envelope in three flights. During the next 13 flights, this envelope was examined more closely and after a brief lay-up to install performance instrumented 04 engines, A01 flew again on programme before Christmas. In January, performance testing began. Transonic and supersonic acceleration proved to be, as predicted, better than that of the IDS due to the extra fuselage length and increased fineness ratio. Mach 1.8 was achieved on several occasions, with a healthy rate of acceleration remaining at the current limit. The increased fuel capacity over the IDS resulted in a considerable increase in flight time and, consequently, in data points achieved on each sortie. Tests carried out on A01 included slow downs, stick jerks, Dutch rolls, partial rolls, straight steady sideslips and limited rolls to obtain detailed definition of the four Sky Flash configuration. Airfield tests, such as twin-

engine and simulated single-engine overshoots, were also undertaken. A01 was tested in four configurations: clean; four Sky Flash semi-submerged under the fuselage; Heavy Combat configuration — four Sky Flash and two Sidewinders mounted on the underwing pylons; and Combat Air Patrol configuration — four Sky Flash, two Sidewinders and drop tanks. Successful engine re-light checks were undertaken at various heights between 10,000ft (3,048m) and 30,000ft (9,144m) and a number of in-flight refuelling sorties were made; consequently, several long flights were achieved including one of over 3½hr. Future testing will include clearance of the flutter envelope to above Mach 2 and firing Sky Flash missiles. Prototypes A02 and A03 (ZA267 and ZA283) will join the flight test programme this year and will be used for avionics and weapons-system testing and integration.

●Stop Press

German Tornado Prototype 04, D-9592, crashed on 16 April 1980, while on a test flight from MBB Manching. At the time of going to press, the cause of the accident was unknown.

Maiden flight of BAe Jetstream 31

The prototype of the BAe Jetstream 31 made its maiden flight on 28 March 1980 from Prestwick Airport, Scotland and was airborne for 1hr 22min. Aboard on the flight were BAe test pilots Angus McVittie and J. L. S. 'Len' Houston, J. R. 'Bob' Baker from Garrett-AiResearch and BAe flight test engineer Andrew Eldred.

Developed from earlier models of the aircraft — originally designed by the former Handley Page company — Jetstream 31 has been produced to meet applications in the commuter airline, corporate transport and military communications roles. The aircraft is powered by two Garrett-AiResearch TPE 331-IOU engines and also features advanced technology propellers and new electrical, air conditioning and cockpit systems.

With production centred at the BAe Scottish Division plant at Prestwick, the Jetstream 31 is expected to begin to emerge in numbers in 1981 when nine aircraft are programmed, building up to a planned output of 25/year.

Above: The development prototype of the Jetstream 31, G-JSSD, during an early test flight; the aircraft is powered by Garrett-AiResearch TPE331-IOU turboprops, and these constitute the major external difference of the Jetstream 31 variant.
Photo: British Aerospace

Below: Learjet 25B, G-BBEE, residing in CSE's new business aircraft facility at Stansted airport. The base was officially opened on 24 March 1980 by Norman Tebbit MP, Parliamentary Under-Secretary of State for Trade, and CSE plans to invest over £1 million on the project to provide a modern corporate aviation facility. Major work is expected to commence in 1981.
Photo: Allan Burney

Boeing to build ALCM

The Boeing Aerospace Company has been selected to build the AGM-86B Air Launched Cruise Missile (ALCM) for the US Air Force — in preference to the General Dynamics AGM-109 against which it has been engaged in a direct 'fly-off' competition.

Boeing will now enter full-scale production of the missile — first in its ALCM facilities in the development centre, Seattle, and later in an ALCM facility to be opened at the Boeing Space Centre in Kent (just south of Seattle) — and the US Department of Defense has announced the intention of ordering some 3,400 ALCMs for deployment on the Air Force's fleet of B-52G bombers. The B-52 can carry up to 20 of these missiles — eight in a rotary launcher in the bomber's weapon bay, and another six under each wing; each missile will have a range of over 1,500 mile.

Dutch plan to double F-16 procurement

The RNethsAF plans to order 111 additional F-16 aircraft to complement the 102 they already have on order.

A report by the Dutch Government issued on 26 March 1980, outlined a decision to start negotiations for an order of 30 F-16s to compensate for peacetime attrition of the ordered 102 aircraft (which are replacing five F-104G Starfighter squadrons), and also revealed a plan for an order of 81 F-16s (to replace the present NF-5 aircraft of four RNethsAF squadrons). The aircraft will be introduced into service between 1985-1989.

Airliner Orders

Airline	*Aircraft*	*No*	*Ordered*	*Delivery date*
Air France	Boeing 747B	1	Feb 80	n.d.
Air Lanka*	L 1011-500 TriStar	2-f	31 Mar 80	1982
		2-o	31 Mar 80	n.d.
Ansett Airlines*	Boeing 727-200	4	17 Mar 80	n.d.
	Boeing 737-200	12-f	17 Mar 80	c Jul 81 Jun 82
		4-o	17 Mar 80	n.d.
	Boeing 767	5	17 Mar 80	(see notes)
Britannia Airways*	Boeing 767	2	1 Apr 80	c 1984
China Airlines	Boeing 747SP	1	21 Mar 80	1982
	Boeing 747-200B	1	21 Mar 80	1982
	Boeing 767	2	21 Mar 80	Dec 82 & July 83
Delta Air Lines*	L 1011-1 TriStar	2	17 Mar 80	Dec 81 & Jan 82
Evergreen Helicopters*	Sikorsky S-76 Spirit	20	2 Apr 80	c 83
Loganair*	Embraer Bandeirante	1	Mar 80	(see notes)
Maersk Air	Boeing 737	3	Feb 80	n.d.
Mexicana Airlines	Boeing 727	5	Feb 80	n.d.
Philippine Airlines*	BAe One-Eleven 500	2	2 Apr 80	July 80
Pacific Southwest Airlines*	DC-9 Super 80	7-f	1 Apr 80	1982
		6-o	1 Apr 80	1983
SATA*	BAe 748	1	25 Mar 80	June 80
Transbrasil*	Boeing 757	2	1 Apr 80	Oct & Nov 83, & June 84
Western Airlines*	Boeing 767	6-f	20 Mar 80	c 1983
		6-o	20 Mar 80	(see notes)
	Boeing 727-200	3	20 Mar 80	May 80

Notes

Airliner Orders

Air Lanka: The TriStars will be operated by Air Lanka (the airline formed in 1979 to succeed Air Ceylon as the national carrier of Sri Lanka) on routes from Colombo to Europe and the Far East. The sale of engines for the aircraft plus spares over their life will be worth more than £30 million to Rolls-Royce.

Ansett Airlines: The first four B767s will be delivered to the airline in Nov 82 and Jan 83 and Ansett also holds options on additional B767 delivery positions. The carrier also announced that it has advised Boeing of 'very definite interest' in the B757.

Britannia Airways: Britannia is the first UK airline to order the B767 which will replace B737s in the carrier's fleet. The aircraft will be equipped for 265 seats in Britannias all-charter configuration with a capability of seating 289 passengers in an IT layout. The announcement brings total firm orders for the B767 (as of 1 Apr 80) to 150 plus 134 options. The maiden flight of the type is scheduled for the latter half of 1981.

Delta Air Lines: Conversion to firm orders of two of the options on the type held by the airline (see *Jan 79*, p8).

Evergreen Helicopters: The US $25 million contract calls for the delivery of five Spirits/year for four years. As of 2 Apr 80 total orders for the S-76 were 350.

Loganair: It is reported that the aircraft was scheduled to be delivered in May 80.

Philippine Airlines: The order brings PAL's total BAe One-Eleven fleet to 12 aircraft.

Pacific Southwest Airlines: Confirmation of the additional follow-on order by PSA for 13 DC-9 Super 80s reported in *May 80*, p203.

SATA: The order will increase SATA's (*Sociedade Acoreuna de Transportes Aereos*) BAe 748 fleet to three aircraft.

Transbrasil: With this sale, 45 firm orders for the B757 have been announced by Boeing. The first delivery to an airline is scheduled for early '83.

Western Airlines: Western will receive its first three B767s c 83 and three c 84. Three of the aircraft on option will be available for delivery in 1984 and three in 1985 if the options are exercised. The B727 order is the firming-up of previously held options.

Airliner Deliveries

Airline	*Aircraft*	*No*	*Delivered*	*Date ordered*
Air Canada*	Boeing 727	1	Feb 80	Feb 78
Air France*	Airbus A300	2	Mar 80	9 May 79
	Boeing 747B	1	Feb 80	n.d.
Air India*	Boeing 747B	1	Feb 80	Jan 79
Air Inter*	Airbus A300.B2	1	Feb 80	July 78
All Nippon Airways*	Boeing 747-100B (SR)	1	Feb 80	27 June 78
Braniff Airways	Boeing 727	4	Feb 80	Sept 78
Britannia Airways	Boeing 737	1	Feb 80	Nov 78
British Airways*	Boeing 737	3	Feb 80	10 July 78
CAAC*	Boeing 747(SP)	1	Feb 80	16 Dec 78
Frontier Airlines	Boeing 737	1	Feb 80	May 78
Iran Air*	Airbus A300.B2	1	17 Mar 80	Mar 78
Japan Airlines	Boeing 747-100B	1	Feb 80	n.d.
Olympic Airways*	Airbus A300.B4-100	1	Mar 80	10 Jun 78
Orion Airways*	Boeing 737	2	Feb 80	n.d.
Pakistan International Airlines*	Airbus A300.B4-200	2	Mar 80	July 78
Pan American World Airways*	L 1011-500 TriStar	1	11 Apr 80	Apr 78
Philippine Airlines	Boeing 747B	1	Feb 80	n.d.
Republic Air	Boeing 727	1	Feb 80	Dec 78
SAS*	Airbus A300.B2	1	Mar 80	Dec 77
Singapore Airlines	Boeing 747B	1	Feb 80	10 May 78
Thai Airways International*	Boeing 747B	1	Feb 80	Aug 78
Trans World Airways	Boeing 727-200	5	Feb 80	17 Oct 78
United Airlines	Boeing 727	1	Feb 80	14 July 78

Notes

Airliner Deliveries

Air Canada: Completion of the order reported in *Apr 78*, p164 (see also *Apr 80*, p152).

Air France: See *Jul 79*, p309 for A300 order.

Air India: See *Apr 79*, p145.

Air Inter: Delivery of the sixth A300 ordered by Air Inter (see *Oct 78*, p477).

All Nippon Airways: Completion of the order reported in *Sept 78*, p425.

British Airways: See *Sept 78*, p425.

CAAC: See *Mar 79*, p111. A second B747(SP) is scheduled to be delivered in June.

Iran Air: The first of six of the type ordered by the airline in Mar 78 (see *May 78*, p216). Iran Air was scheduled to receive its second A300 in April.

Olympic Airways: Delivery of the airline's third A300; Olympic was scheduled to receive two further examples in April.

Orion Airways: See photograph in last month's issue p204.

Pakistan International Airlines: The first two of three A300s scheduled to be delivered to the airline in March (see *Oct 78*, p477). The aircraft will be used on PIA's domestic trunk routes and to points in the Arab Emirates.

Pan American World Airways: The aircraft (N5049A) is the first of six -500s that PanAm will receive this year; the airline is scheduled to receive six more -500s in 1981 and has reserved options on 14 more (see *June 78*, p268). The delivered aircraft will be used extensively for pilot training and the first passenger flight (between New York and Caracas), was scheduled for 1 May 80.

SAS: The second aircraft under the order reported in *Mar 78*, p112 (also see *Apr 80*, p152).

Thai Airways International: This delivery, together with the ones featured in *Apr 80*, p152, completes the order reported in *Nov 78*, p529.

Key:

n.d.=no details, e=early months of year, c=commencing date, f=firm orders, o=options, * see notes.

airnotes

The first of 33 Chinooks ordered by the RAF from Boeing Vertol, ZA670, made its maiden flight on 23 March 1980. The RAF is scheduled to receive its first example later this summer; in RAF service the Chinooks will be designated HC Mk1.

●

Gates Learjet Corporation reached a major milestone on 28 March 1980 when it delivered the 1,000th Learjet — a Century III 35A. Learjets have now flown over one billion miles during more than 2.6 million flight/hr. The occasion was also marked by the roll-out of the first production 'widebody' Learjet Longhorn 50 series business jet.

●

Canada has selected the McDonnell Douglas F-18A as its 'new generation' fighter/interceptor aircraft. It is reported that the deal is initially for 140 aircraft and that the order is worth approximately $3,000 million.

●

It is reported that Braniff Airways will suspend its subsonic Concorde service between Washington and Dallas-Fort Worth on 1 June 1980, because the route has proved uneconomical. The main factor which influenced Braniff's decision is believed to have been the major rise in aviation fuel prices which have taken place since the five times a week service began in January 1979.

●

The Civil Aviation Authority has approved an application by British Caledonian to operate between London and Hong Kong in competition with British Airways. British Caledonian plans to inaugurate services from Gatwick to Hong Kong at the beginning of August 1980, building up to a daily service in November.

●

The French Air Force and Navy have placed an order for 35 EMB-121 Xingus with the Brazilian manufacturer Embraer.

●

It is reported that Republic Airlines — the US regional carrier formed in 1979 from a merger between Southern Airways and North Central Airlines — has agreed in principle to acquire Hughes Airwest; the airline which is partly owned by the estate of the late Howard Hughes.

air register

Compiled by A. J. Wright

THE BRITISH AIRWAYS and Airtours Boeing fleet is steadily growing, although of course the marks have been reserved for many months awaiting delivery.

The four additional Friendships for Air UK come from Touraine Air Transport and are due to replace a similar number of Heralds currently leased from British Air Ferries. There will be a few months' overlap since the latter type will not return to their owner until the end of August.

Among the usual additions a Cessna 120 shines forth, the first postwar design to come from the company. Over 2,000 were built, of which a fair number survive in America. In Europe it is a distinct rarity.

Registration	Type	C/n	Owner or operator
G-BGDA	Boeing 737-236	21790	British Airways
G-BGDB	Boeing 737-236	21791	British Airways
G-BGDC	Boeing 737-236	21792	British Airways
G-BGDD	Boeing 737-236	21793	British Airways
G-BGDE	Boeing 737-236	21794	British Airways
G-BGDF	Boeing 737-236	21795	British Airways
G-BGDG	Boeing 737-236	21796	British Airways
G-BGDH	Boeing 737-236	21797	British Airways
G-BGJE	Boeing 737-236	22026	British Airtours
G-BGJF	Boeing 737-236	22027	British Airtours
G-BGJG	Boeing 737-236	22028	British Airtours
G-BGJH	Boeing 737-236	22029	British Airtours
G-BGWP	Bolkow Bo105C	S-41	Management Aviation Ltd (HB-XFD/N153BB/ D-HDAS)
G-BHAG	SF-25E Super Falke	—	British Gliding Association
G-BHBH	Cessna 550 Citation II	133	R. G. E. Armfield
G-BHGK	Sikorsky S-76	760049	North Scottish Helicopters
G-BHIK	Adam RA-14 Loisire	11	C. Lovell (F-PHLK)
G-BHIR	PA-28R Cherokee Arrow 200	35614	J. P. Aviation (SE-FHP)
G-BHJA	Cessna A152	0835	Capital Aviation Sales Ltd (N4954A)
G-BHJB	Cessna A152	0856	Capital Aviation Sales Ltd (N4662A)
G-BHJD	Cessna 152	83295	Capital Aviation Sales Ltd (N48172)
G-BHJE	Beech 58P Baron	TJ-265	Eagle Aircraft Services Ltd
G-BHJX	Partenavia P68C	219	Hamilton Aviation Ltd
G-BHKY	Cessna 310R2	1861	Air Service Training Ltd
G-BHLL	Cessna 421C	0882	Northair Aviation Ltd
G-BHLM	Cessna 421C	0871	Northair Aviation Ltd
G-BHLN	Cessna 441	0154	Career Care Group Ltd
G-BHLW	Cessna 120	10210	J. E. Cummings (N73005)
G-BHMA	SIPA S903	61	Fairwood Flying Club (OO-FAE/F-BGBK)
G-BHMW	F-27 Mk200 Friendship	10229	Air UK (F-OGIF/F-BUTA/ JA8618/PH-FEU)
G-BHMX	F-27 Mk200 Friendship	10259	Air UK (F-BUFO/JA8634/ PH-FGA)
G-BHMY	F-27 Mk200 Friendship	10196	Air UK (F-GBDK/PK-PFS/ JA8606/PH-FDL)
G-BHMZ	F-27 Mk200 Friendship	10244	Air UK (F-GBRY/PK-PFV/ JA8624/PH-FFK)
G-BHNK	Jodel D120A	243	C. C. Lovell (F-BLNK)
G-BHNV	W-Bell 47G-3B1	WAT-222	Specbridge Ltd
G-BHOB	Cessna 404	0612	Alexandra Aviation Ltd
G-BHOG	Sikorsky S-61N	61825	Bristow Helicopters Ltd
G-BHOK	Mooney M20J	0950	Express Aviation Services Ltd (N3818H)
G-BHOM	PA-19 Super Cub 95	18-1391	W. J. C. Scrope (OO-PIU/ OO-HMT/51-15391)
G-BHOS	Mooney M20K	0301	Express Aviation Services Ltd (N231LQ)
G-BHOV	Partenavia P68C	223	Lowland Aero Service Co
G-BHOW	Beech 58PA Baron	TJ-176	Anglo African Machinery Ltd (N2049E)
G-BHOZ	SOCATA TB-9 Tampico	84	Air Touring Services Ltd
G-BHPA	Sikorsky S-61N	61775	Management Aviation Ltd
G-BHPE	BN-2B-26 Islander	2021	Pilatus Britten-Norman
G-BHPF	BN-2B-27 Islander	2022	Pilatus Britten-Norman
G-BHPG	BN-2B-21 Islander	2023	Pilatus Britten-Norman
G-BHPN	Colt 12A balloon	081	Colt Balloons Ltd
G-BHPO	Colt 12A balloon	082	Colt Balloons Ltd
G-BHPW	Aerostar 601P	8063380	CSE Aviation Ltd (N3634A)
G-BHRA	Commander 114A	14505	Rockwell Aviation Ltd
G-BHRB	Cessna F152	1707	Westair Flying Services
G-BHRE	Persephone S200 balloon	21	Cupro Sapphire Ltd
G-BHRH	Cessna FA150K	0056	Citation Flying Services Ltd (PH-ECB)
G-BHRI	Can-Can S200 balloon	20	Cupro Sapphire Ltd
G-BHRJ	Sikorsky S-76A	760025	Bristow Helicopters Ltd
G-BHRO	Commander 112A	364	John Raymond Transport Ltd (N1364J)
G-BHRU	Petunia S1000 balloon	1	Cupro Sapphire Ltd
G-BJHK	Acro Sport	72-10476	J. H. Kimber
G-BLCG	SOCATA TB-10 Tobago	61	Crescent Leasing (G-BHES)
G-BMAA	Douglas DC-9-15	47048	British Midland Airways Ltd (G-BFIH/N65358)
G-BPCP	Cessna 500 Citation	0403	Penarth Commercial Properties Ltd
G-CJHH	Cessna 550 Citation II	132	Armstrong Aviation Ltd
G-EWBJ	SOCATA TB-10 Tobago	101	Crooker Air Services
G-GKNB	Beech 200 Super King Air	BB-705	GKN Group Services Ltd
G-GOOS	Cessna 182	0145	Rogers Aviation Ltd
G-HILL	Cessna U206	01706	Citation Flying Services Ltd (PH-ADN)
G-MARY	Cassutt Speed 1	2	J. Chadwick
G-MCDS	Cessna 210	63070	Westair Flying Services Ltd (G-BHNB)
G-MDAS	PA-31 Navajo 310	7401239	Milford Haven Dry Dock Co Ltd (5N-AEP/G-BCJZ/ N61427)
G-ORAY	Cessna F182Q II	0131	Air Service Training (G-BHDP)
G-SPTS	Beech C90 King Air	LJ-874	Seabourne Express Ltd
G-WOLF	PA-28 Cherokee 140	7425439	Citation Flying Services Ltd (OY-TOD)

Below: A registration featured in last month's column, G-BHNE, and assigned to an ex-Sterling Airways Boeing 727-200 acquired by Dan-Air; the aircraft is seen at Lasham on 22 March 1980 after its delivery two days earlier.
Photo: Robin A. Walker

air books

All Ian Allan publications here reviewed can be obtained from Ian Allan Mail Order Dept, Terminal House, Shepperton, Middlesex TW17 8AS; please enclose remittance shown and mark envelope 'MO' on top-left corner. It might be possible to supply other publishers' books but first enquire of the Mail Order Dept by 'phone (Walton-on-Thames 28950) or reply-paid letter.

Halifax, *by K. A. Merrick, published by Ian Allan Ltd (224pp) at* **£9.95**

This study of the Handley Page Halifax helps to further redress the balance of book coverage which has seen the type unfairly treated in relation to the RAF's more famous heavy bomber of the WW2 period, the Lancaster. The Author has put together a wide ranging history of the Halifax' career which reflects the aircraft's versatility, its application to numerous roles — airborne forces operations, 'cloak and dagger' tasks, maritime missions, meteorological reconnaissance, radio/ radar countermeasures, and transport duties as well as its use as a heavy bomber — and its service in many other theatres of WW2 in addition to Northwest Europe. The book is aptly described as an illustrated history and its large number of photographs amply chart the Halifax record — from the development stage, through its WW2 service, and postwar use as a civil aviation transport, the Halton. Twenty pages of appendices at the back of the book itemise Halifax squadron records, production contracts, serial numbers, design data; and also provide a register of the commercially employed aircraft post-WW2.

Corsair — the F4U in WW2 and Korea *by Barrett Tillman, published by Patrick Stephens Ltd (236pp) at* **£8.95**

The Vought F4U Corsair fighter was not the most attractive aircraft to appear during WW2 and its unusual inverted, gull-shaped wing soon earned it the nickname 'bent-wing bird' (among other references along the same lines!). However, the effectiveness of an aircraft design is not measured by its looks but on its performance and in this respect the Corsair proved outstanding — during early test flights the prototype (XF4U-1) became the first US single-engined fighter to attain speeds of over 400mph.

In a long and distinguished career which began in 1940 and spanned over 38 years the versatile Corsair was operated as a day fighter, night fighter, dive bomber and reconnaissance aircraft, flying both land-based and carrier-based missions.

A 'clipped-wing' variant of the Corsair (eight inches were 'pruned' from each wingtip in order to accommodate wing folding in the lower overheads of British carrier hangar decks) served with the Royal Navy, which received a total of 2,012 of the type.

The many varied facets of the Corsair story are well covered in this latest book by Barrett Tillman and his substantial text contains many combat details; the account of Corsair pilot Capt Jesse Folmar 'downing' a MiG-15 jet fighter is perhaps one of the most gripping.

Royal Flying Corps — From Borden to Texas to Beamsville *by William E. Chajkowsky, published by The Boston Mills Press* (128pp) at* **$15.95**

This well illustrated, large format (11in by 8¼in) volume chronicles a less well known aspect of flying training operations during WW1 — the activities of the Royal Flying Corps in Canada. The core of the story is the establishment of training facilities at Borden, Ont, the re-location of the programme to airfields in Texas to avoid the winter weather of 1917-1918, and the return to Canada in April 1918 — in particular, to a new airfield at Beamsville, Ont. The Canadian training programme of the RFC began in January 1917 and with the American entry into the war four months later, the fledgling Aviation Section of the US Army Signal Corps was very receptive to the Canadian offer of training for US pilots in return for the use of airfields in Texas during the formidable Canadian winter — hence the book's sub-title. It is, in effect, a pictorial history of the RFC sponsored flying training in Canada and the US, and of the Canadians who enlisted in the Corps during its 700 day stay in North America.

*RR1, Cheltenham, Ontario, LOP 1CO, Canada.

RAF Bombers — part 1 *and* **RAF Fighters — part 2 (WW2 aircraft fact files)** *by William Green and Gordon Swanborough, published by Jane's Publishing Co (76pp and 60pp respectively) at* **£3.95** *each*

The two latest titles in the continuing WW2 aircraft fact files volume; a series which, when completed, will detail the various types of aircraft employed operationally by, or under development for, all the major combatant nations of WW2. The information afforded to each type covers specifications, variants, sub-types and operational service and the text is supplemented in many cases by some fine cutaway and three-view line drawings. The aircraft featured in RAF Bombers part 1 include the Armstrong Whitworth Whitley, Avro Manchester and Lancaster, Bristol Blenheim and de Havilland Mosquito (part 2 details the bombers produced by Fairey, Handley Page, Short and Vickers); and the main theme for RAF Fighters part 2 is the Hawker family of aircraft — Hurricane, Tornado, Typhoon, Tempest and Fury (monoplane).

After the Battle Airfield Plans *published by* After the Battle Magazine *at* **90p** *each individual plan (binder for 25 plans available at* **£3.30p**)*

The publication of an initial series of 50 airfield plans (dated between 1920s-50s), comprising stations from all the commands of the RAF. Produced with the co-operation of the RAF Museum, the plans have been reduced from the originals to a uniform 17in × 25in size for easy handling in the field. Location plans show the airfield's position in relation to the surrounding countryside and, for some aerodromes, detailed drawings are available showing the dispersed sites which were an equally important part in the life of the station. Subjects available include: Abingdon (1934), Attlebridge (1944), Biggin Hill (1924), Bourn (1944), Croydon (1944), Duxford (1939), Leuchars (1933), Lossiemouth (1945), Methwold (1944), Northolt (1931), Ringway (1945), Stansted-Mountfitchet (1945), Thorpe Abbotts (1946) and Turnhouse (1939).

*Each plan is folded inside a waterproof plastic wallet punched ready for binding. Plans and binder are obtainable from *After the Battle Magazine*, 3 New Plaistow Road, London E15 3JA.

Pacific Aircraft Wrecks . . . and where to find them *by Charles Darby, published by Patrick Stephens Ltd (88pp) at* **£9.95**

A collection of fascinating photographs of WW2 aircraft wrecks which are scattered around former battlegrounds in the Pacific theatre of conflict.

Many rare types are seen in various states of deterioration but perhaps the most outstanding example is a virtually intact B-17E of the 22nd Bomb Squadron, 'residing' in the Agaiambo swamps of Papua.

Locations and individual histories of most aircraft are provided and the text describes several salvage operations successfully accomplished by the author.

Erratum

In our review of 'Bring back my Stringbag' (*Aircraft Illustrated*, March 1980, pages 106-107) we incorrectly stated that the Author, Lord Kilbracken, had completed over 1,000hr on operations while flying the Swordfish. As the Author kindly commented in a subsequent letter, the juxtaposition of the 1,000hr figure in relation to the 67 combat sortie tally, 'gives the impression that the average length of each mission was about 15 hours. Even the Swordfish couldn't manage that. (The fuel capacity was about 170 gallons). The facts are that our maximum range was about 400 miles, which would take some 4½hr; and that the average length of my missions was something under 3hr.' *Ed.*

THE BLACKBURN Beverley -a pictorial biography

Thirty years ago this month, an embryo Beverley took to the air to become the largest baby in the Blackburn cradle. **Peter Gilchrist** *takes a look at the early history of this marvellous old aeroplane.*

DURING THE CLOSING stages of the war in Europe, F. F. Crocombe, Chief Designer of the old General Aircraft Ltd at Feltham in Middlesex, had foreseen the requirement for a new kind of aeroplane to support airborne troops. The concept of invasion from the air — a modern replacement for the shock value of the cavalry — had been proved often enough in the battles for Arnhem, Normandy, Sicily and North Africa, but the initiative gained by the surprise arrival of several thousand men, was often lost by the need to secure a beach-head and await the arrival of all the paraphernalia of mechanised warfare. How much more decisive the battles could be if mechanised transport and weaponry could arrive *with* the troops and go into immediate action.

Crocombe began to look seriously at the problem immediately after the war, and had completed several design studies before the Air Ministry had caught up with his thinking and issued Spec C.3/46. This specification drew heavily on wartime experience and called for an aircraft with a payload capacity of 25,000lb and a range of 500 miles; typically, the requirements also asked for heavy-drop capability *and* the ability to tow gliders — a belt-and-braces return to the 'traditional' way of doing things, using the Hamilcar-type delivery system.

Almost inevitably, General Aircraft was asked to build a prototype of its submission for C.3/46; the aircraft was designated GAL60, and named Universal Freighter in recognition of its civil and military potential. Work began at Feltham on the contracted prototype, and on a number of long-lead items for an anticipated second aircraft. During 1948, discussions between General Aircraft Ltd and the old-established Humberside firm of Blackburns led to a merger of the two companies under the joint name of Blackburn & General Aircraft Ltd. The new company was formed on 1 January 1949, and it was proposed that all work in progress at the various factories be completed as originally planned; assembly of the half-finished Universal prototype was therefore continued at Feltham and work proceeded normally until its completion in October of that year. Only then was it decided that Hanworth Aerodrome — adjoining the Feltham premises — was totally unsuitable for the first flight of such a massive aeroplane! As a result of this unfortunate discovery, the whole thing was taken apart again and loaded on to lorries for the journey to Brough, where it was re-assembled after considerable difficulty, and successfully flown as WF320 on 20 June 1950.

By any standards, the new baby was a big one; 28 tons of metal built on almost architectural principles concealed a main freight hold 36ft long, 15.5ft high and 10ft wide. The forward hold — tucked away underneath the flight-deck — was 15ft long, with a headroom of nearly 7ft, and the tail-boom provided a rabbit-warren of individual compartments, sloping down towards the main hold and punctuated by structural frames. The 162ft wing stood over 20ft from the ground and the tailplane span, at 42ft, was 5ft longer than the wing of a Meteor F8! The single mainwheel tyres were over 6.5ft in diameter.

Above left: The 'Confidential' status of the Blackburn & General submission to Ministry of Supply Spec C.3/46 is well illustrated by this picture of the prototype, taken some weeks before the first flight. The aircraft was to undergo significant changes before the first flight of the second machine some three years later. *Photo: British Aerospace, Brough*

Left: Only three months after its maiden flight, the Universal Freighter dwarfed every other exhibit at the 1950 SBAC Display at Farnborough. The enormous mainwheels — each nearly 7ft in diameter — were later to give way to the familiar 4-wheel bogie units used on all production Beverleys. *Photo: MoD(PE), RAE Farnborough*

Above right: The cavernous cargo hold of WF320 was often shown accepting outsize loads with considerable ease. This coach was just one of a number of heavy items loaded aboard for a few circuits of Brough during the development phase of the flying programme. The rear fuselage and door geometry were to change considerably on production aircraft to allow bulky loads to be air-dropped. *Photo: British Aerospace, Brough*

The aircraft was designed for a rough-field environment, and the possibility of battle damage had been considered from the outset. At any time it could be called away from a convenient airfield servicing unit and flown into primitive, and perhaps hostile, areas with minimal maintenance facilities. Everything had to be kept as simple as possible: no pressurisation, no pneumatics, no retractable undercarriage or fancy structural techniques that could fall apart under the considerable stress of rough-field operations at gross weights in excess of 100,000lb.

Part of Spec C.3/46 called for a service ceiling of 18,000ft. This led to discussions with the Engine Division of The Bristol Aeroplane Company which agreed to develop a special Hercules unit with a two-speed supercharger and other refinements that would push its take-off power to 2,040hp at 2,800rpm. The engines were mounted as self-contained, un-handed powerplants that were fully interchangeable, each driving a 14ft diameter Rotol constant-speed propeller with feathering and reverse pitch facilities.

After the successful first flight, the company's chief test pilot, 'Tim' Wood — who had originally been with General Aircraft Ltd — set about the initial handling trials with D. G. Brade as his co-pilot. An enormous amount was achieved very quickly. The simplicity of construction and the overall soundness of the design, made it possible to complete all the essential clearances in 21 flights.

The anticipated second prototype was ordered at the 1950 SBAC display, where WF320 had made every other exhibit look tiny. The new aircraft was to be significantly re-designed around four 2,850hp Bristol Centaurus engines: the rear fuselage shape would be altered to accommodate removable clamshell doors, and the tail-boom would be enlarged and structurally re-designed to provide seating for up to 42 passengers. At this time the manufacturers were still hopeful of civil sales and were quoting a fly-away price of just under £400,000 and a direct operating cost of under 14/- (remember shillings?) per mile.

For nearly 18 months the first aircraft was used on a series of trials to develop some of the features proposed for the second. The loading ramp and rear doors were removed, and the single mainwheels were replaced by the more familiar four-wheel bogie units. Structural considerations prevented full modification of the tail-boom, but a great deal of heavy dropping was done to look at possible load exit problems and aircraft trim changes during violent centre of gravity movement.

Permission to go ahead with construction of the second machine was finally given during the Spring of 1952. Although the new aircraft amounted to a major re-design of the original Universal Freighter, it was completed in just 15 months; many of the heavy components that were made at Feltham during 1948-49 — particularly for the wing and centre fuselage — were virtually unchanged and could almost be used from stock. The Universal Mk2 (WZ889) made an uneventful first flight from Brough on 14 June 1953.

The intervening period had been a heartening one for everyone connected with the project at Brough. In September 1952 the Air Ministry, which was by then satisfied with the final re-design, gave approval for an initial batch of 20 for the RAF under the type name Beverley CMk1. Production began almost immediately, with work being shared between the company's factories at Dumbarton and Brough. Most of the important sub-assemblies were manufactured at Dumbarton and then taken by road to the aircraft production line at Brough. By the time the first machine was recognisable as a Beverley under construction, the RAF's commitment to the type had jumped to 47.

The second batch was ordered during May 1954 and it guaranteed continuous production until the summer of 1958.

The first two production Beverleys (XB259 and XB260) were flown during January and March 1955: they were retained for some time as development machines, as were the second pair (XB261 and XB262), both of which were delivered to Boscombe Down in July 1955 for the usual acceptance, handling and flight limitations programme. Squadron life for the Beverley began on 12 March 1956, when XB265 was delivered to the Abingdon-based No 47 Squadron. By May 1958, three other squadrons (Nos 53, 30 and 84) had re-equipped with the aircraft, and a flight of four machines was attached to No 48 Squadron in Singapore. This flight was later to receive another aircraft and achieve full squadron status (as No 34 Squadron) in March 1959.

After just a decade of squadron service, during which the Beverleys rendered a vital heavy airlift capability to RAF Transport Command in the NATO area and further afield — Cyprus, East Africa, the Middle East and the Far East, the aircraft's withdrawal from the RAF took place in 1967-68 at the time of the RAF's acquisition of the Lockheed C-130K Hercules.

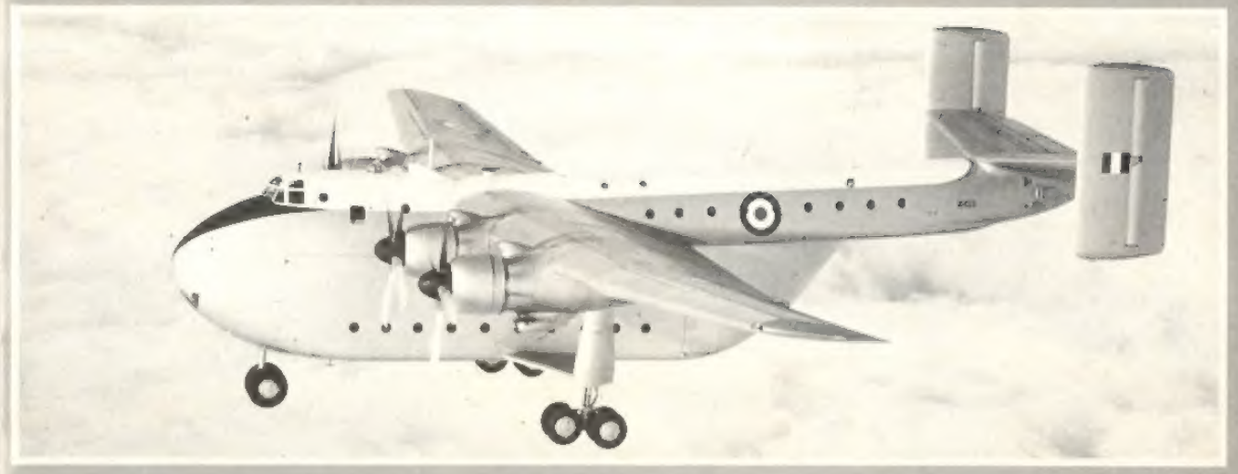
Above: One of the first production batch of 20 aircraft, XB289 was first flown on 21 August 1956. Just two weeks later it was one of the stars of the SBAC display at Farnborough and must surely be counted among the smartest Beverleys ever to fly. Imagine the problems of cleaning those massive nacelles, over twenty feet from the ground!
Photo: Capt Dougie Akhurst

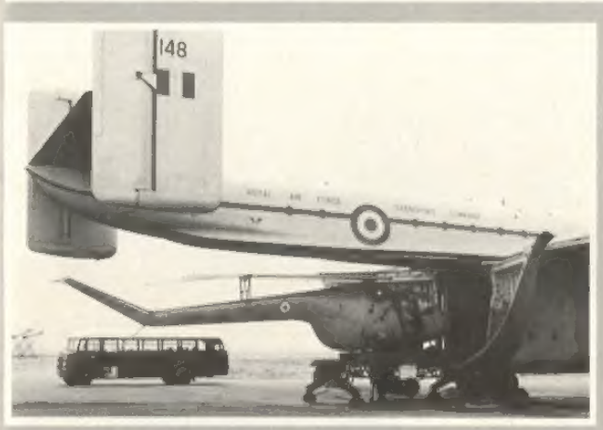
Below left: Although the two Universal prototypes and the first two production Beverleys were all allotted civil registrations, it is believed that G-AOEK was the only one actually carried by an aircraft. The second production machine, XB260, was flown in this civil guise during the politically sensitive Umm Siad airlift during late-1955. The aircraft moved 129 tons of oil drilling equipment to an otherwise inaccessible site at Jebel Fahud, 365 miles away over some of the roughest terrain in the Middle East.
Photo: British Aerospace, Brough

Top right: The familiar shape of a standard production Beverley C1 in Royal Air Force colours. This particular aircraft, XH123, served with No 30 Squadron initially but was later transferred to No 47 Squadron. The photograph must have been taken during the early acceptance tests on the aircraft: the nacelles are virtually free of oil-staining — so much a characteristic of the Centaurus engine — and squadron markings had yet to be applied.
Photo: British Aerospace, Brough

Centre right: The recent departure of RAF and Army helicopters to Rhodesia has highlighted once again the sad lack of large-volume freighting capacity in the RAF. This complete Bristol Sycamore is easily swallowed by the cavernous hold of an OCU Beverley.
Photo: Capt Dougie Akhurst

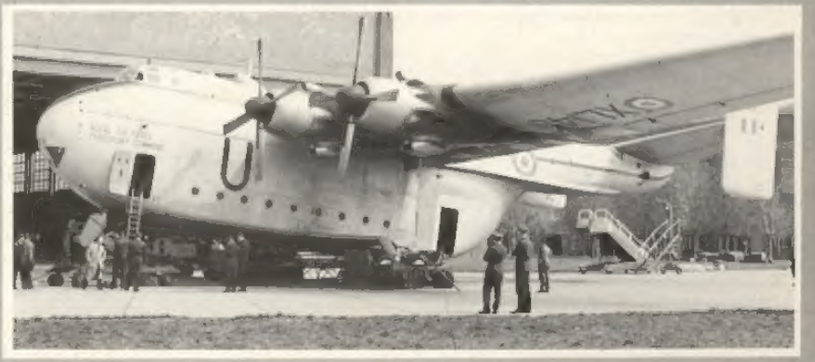
Centre, far right: The sheer size of a visiting Beverley often provoked ribald comments from the host Squadron. On being presented with this awesome sight in the middle of a ramp full of RAF Germany Hunters, one luckless Air Trafficker was moved to enquire, 'Did you have planning-permission to build that thing out there?' Beverley aircrew tended to ignore such low humour, or mutter darkly about having the damp-proof courses checked if they could find anyone 'on this little airfield qualified to do the job'. *Photo: Capt Dougie Akhurst*





Right: The first Squadron to receive Beverleys was No 47 based at Abingdon: its first aircraft arrived on 12 March 1956, and within three months the squadron was fully operational and flying scheduled freight services to RAF bases in Germany. The unit's distinctive Crane's Head crest began to appear with increasing frequency at airfields all over the world. This particular aircraft, XB269, is configured for heavy dropping and is seen in company with an Argosy during operations from Aden.
Photo: Capt Dougie Akhurst

Bottom right: One of the biggest problems encountered by the new Beverley units was the indoor servicing of the aircraft. The tail was a good deal higher than anything previously known in the RAF and the average hangar was simply too low! After some careful thought, these curious devices began to appear all over the country. The idea was simple: jack up the nose and the tail goes down, slide the complete aircraft under the hangar lip on sideways-facing trolleys and release on the other side! This No 242 OCU aircraft, XL148, looks particularly pained about this undignified procedure.
Photo: Capt Dougie Akhurst



Above: The vast wing of a Beverley has been described as a mobile eclipse of the sun. The ponderous looks of the aircraft belie its tactical abilities: landing 'over the hedge' on a rough field, a Beverley could stop in less than 500yd 'if pushed'; it was known to have air-dropped loads in excess of 40,000lb and to have happily carried its maximum all up weight of 135,000lb over a 50ft obstacle in about 950yd. *Photo: Capt Dougie Akhurst*

Above right: All Beverley crews were trained by No 242 OCU, initially located at Dishforth, Yorks and then at Thorney Island, Hants. The OCU was issued with three aircraft — XL132, XL148 and XL149 — straight from the production line during June and July 1957, and it subsequently used a number of ex-squadron aeroplanes. This photograph shows '149' in the early OCU markings, devoid of all RAF Transport Command references and minus the characteristic blue cheat-line. Note also that the roundel is positioned considerably further forward than usual. *Photo: Capt Dougie Akhurst*

Above: 'Time to spare? Fly Bev-Air' — a 47 Squadron wag decorated one of the unit's trucks at Abingdon in a vain attempt to find at least one valid sales pitch related to the Beverley's normal cruising speed of 155kts. *Photo: Capt Dougie Akhurst*

Above right: It was sometimes said — perhaps a little cruelly, that the Beverley's Centaurus engines were oil-fired and petrol-cooled! Certainly the intricate lubrication system of a sleeve-valve engine caused more than the average oil loss and a certain amount of unplanned maintenance.

This steel 'cathedral' structure was one way of overcoming the problem of servicing the engines at their significant altitude above ground level. *Photo: Capt Dougie Akhurst*

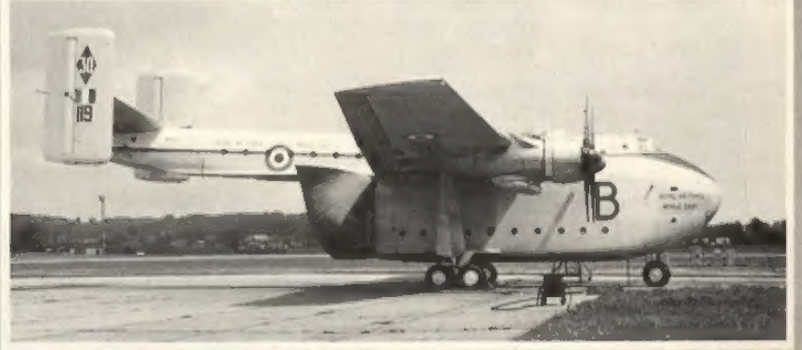
Facing page:
Top left: A No 47 Squadron aircraft configured for a heavy drop task peels-off somewhere over southern England. *Photo: Capt Dougie Akhurst*

Top right: Formation flying in Beverleys could be an interesting experience; a succession of 'aeronautical Dutch Barns' was not unlike a herd of elephants in trail to a water-hole — everyone knowing their position and going to great lengths to keep it properly. This is a close proximity view into another Beverley configured for a heavy drop sortie. *Photo: Capt Dougie Akhurst*

Centre left: For its positioning flight to No 27 MU at Shawbury and final break-up in 1967 this No 84 Squadron aircraft was helped on its way by decorated spinners brightly coloured flowers, and other impromptu artwork and affectionate graffiti, eg 'Centaurus power is flower power', 'UK and/or bust', and 'A thing of beauty is a joy for ever'. *Photo: Capt Dougie Akhurst*

Centre right: No 30 Squadron switched from Hastings to Beverleys at Dishforth in April 1957. The following year the squadron was re-assigned to Kenya where it provided airlift support for the security forces during the Mau Mau emergency; after Kenyan independence No 30 was posted to Muhurraq in May 1965 to operate transport services in the Gulf area before returning to the UK in 1966. The photo shows the squadron's 'B-Bravo', XH119, in its Royal Air Force Middle East titles. *Photo: Capt Dougie Akhurst*

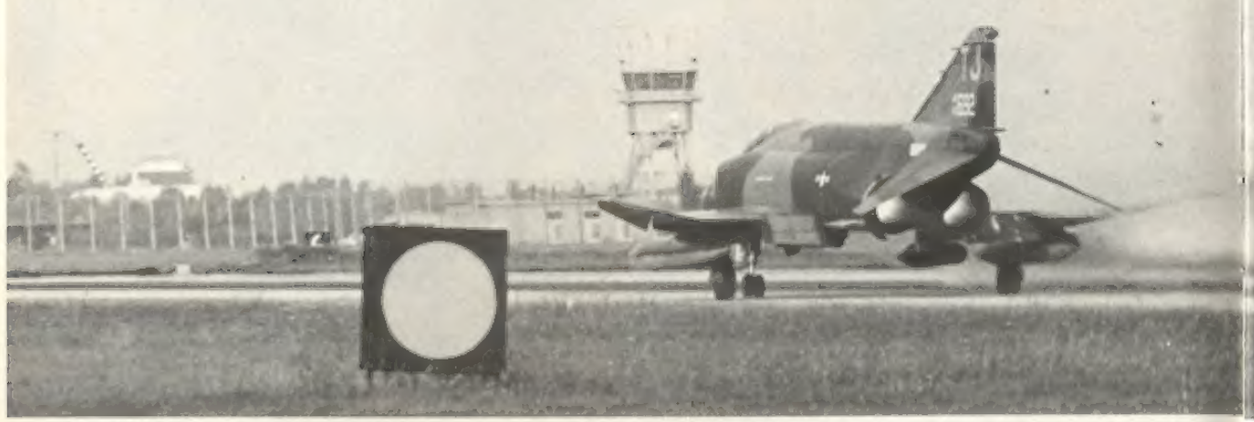
Right: A sad end to a magnificent fleet of aeroplanes. No one has ever accused the Beverley of being a beautiful aeroplane but this picture of their demise at Shawbury is especially poignant in view of the obvious affection for the aircraft shown by the squadron crews. Most of the 47 service machines were 'reduced' at Shawbury during 1967-68.



Acknowledgement
The Author would like to acknowledge the generous assistance of the following during the compilation of this feature: Capt Dougie Akhurst, formerly of No 47 Squadron, RAF and now with Loganair Ltd, and Eric Barker Esq of British Aerospace, Kingston-Brough Division, at Brough, N. Humberside.

Units in USAFE: No 7

The 40th Tactical Group



Below: Afterburners engaged, a pair of 401st TFW F-4D Phantoms launch from Aviano at the start of a sortie during the NATO exercise 'Display Determination' in October 1979.

Martin Horseman

NESTLING AT THE foot of the *Alpi Carnichi*, about 50 miles northeast of Venice, is Aviano AB — home of USAFE's 40th Tactical Group. Aviano is the USAF's only tactical air base in Italy, and this year marks the 25th anniversary of the US presence at a location which dates back some 70 years in the annals of military aviation in Italy.

Although the 40th TG has no aircraft permanently assigned to it in peacetime, the base at Aviano is intensively used by visiting units from Europe and the US, and the Group maintains a readiness to transition to Wing-scale operations in charge of deployed forces should the need arise. This contingency role, under which the base would be the recipient of tactical fighter reinforcements from the US and elsewhere in USAFE, presently covers the reception and operating responsibility for USAFE F-4 Phantoms plus a squadron of RF-4C Phantoms from the other side of the Atlantic. Hardened shelter accommodation around the airfield could already cater for over 40 aircraft, and additional shelters are under construction.

The significance of the activity at Aviano lies partly in the base's strategic location at the apex of NATO's southern front and partly in the training facilities located nearby plus the better weather which offers scope for a more productive training schedule compared to that available in northwest Europe.

The base is only 35 nautical miles from the Italian frontier with Yugoslavia (and only 28nm from the buffer zone flanking the border), and the nearest Soviet Air Force aircraft are 'minutes away', as the 250nm distance from their bases in Hungary is described locally. So the geography of this region underscores the air defence alert which is fulfilled on a continuous basis from Aviano by a detachment of the 401st TFW operating at this forward location while on rotation from their base at Torrejon, near Madrid, Spain.

Left: The fin of the lead aircraft in the above view seen in close-up in one of the Aviano shelter areas: '692' is one of the few aircraft carrying black and white chequered fin markings — the fin-top colours for the 401st TFW squadrons are blue (612th TFS), yellow (613th TFS) and red (614th TFS).

Below left: The range control tower at Maniago, with some of the targets visible in the background.

Below : The Torrejon AB, Spain Phantoms of the 401st TFW are acquiring black wing code letters and USAF s/nos. *Photos: Martin Horseman*

In terms of the national and NATO lines of command, the 40th TG is a component of USAFE's 16th Air Force, headquartered at Torrejon AB but with its commanding general normally operating from Naples in view of his additional responsibilities as the Alliance's Commander, Allied Air Forces Southern Europe (COMAIRSOUTH). In the event of a transition to NATO command as the consequence of an enhanced alert state, the change of operational control would result in the 40th TG becoming a component of NATO's 5th Allied Tactical Air Force (5ATAF), with the tactical tasking in its northern sector undertaken by the 1st ROC (regional operations centre).

The 40th TG regularly plays host to weapons training detachments (WTDs) from tactical fighter units stationed throughout the USAFE area and to deployments from the US exercising their reinforcement role. The air-to-ground training is centred on the Maniago range just a few miles away from the base: the range is run by the Italian Air Force and Army and offers firing and scoring facilities for all types of air-to-surface weapons training.

Including the airfield itself, the Aviano AB operating locations are dispersed among nine separate sites extending over a seven mile spread between the towns of Aviano and Pordenone, the 'off-base' installations including several housing complexes, a 450,000 gal capacity petroleum products tank farm (there is similar capacity storage inside the airfield perimeter) connected to the NATO 4in diameter pipeline from the port of La Spezia, ammunition storage, and maintenance and administration annexes. Beyond the immediate locality of Aviano AB, the 40th TG's responsibilities for numerous tenant and assigned units range widely throughout Italy. Among these units, for example, is the Air Force Communications Service's 2187th Communications Group serving all the operating locations in Italy and with 16 separate

sites in the country. The 7401st and 7402nd Munitions Support Squadrons provide ordnance support for the Italian Air Force at their Rimini and Ghedi air bases while, closer to home, the 40th ASUPS (ammunition support squadron) provides support for the Group.

One aspect of the Aviano-organised and widely spread provision of training and support services that is currently of much interest is the new air combat manoeuvring instrumentation (ACMI) range at Decimomannu in Sardinia operated by 40th TG Det 4 (detachment) on behalf of USAFE and the other allied users. This innovatory facility comprises an air combat training area with audio-visual coverage of the practice engagements providing instantaneous playback to assess tactics and to corroborate weapons employment. USAFE owns the system but its use and the operating costs are being shared with the RAF, *Luftwaffe* and Italian Air Force.

As one of USAFE's seven central region main operating bases (MOBs)* in the NATO area the keynote of operations at Aviano is readiness — best expressed in this case as an ability to move swiftly from peacetime footing to the activation of operations appropriate to tactical fighter wing status. While the incoming augmentation forces necessary to achieve this transformation would obviously bring with them the requisite aircraft, related equipment and support personnel, the task of preparing for the base's mission that falls to the 40th TG demands an imaginative and flexible implementation — for it is only during periodic reinforcement exercises conducted from Aviano that the scale of this contingency operation becomes evident. In between these deployments the base is regularly placed into exercise configuration to meet local training requirements, eg the 40th TG at Aviano was the first USAF unit in Europe to achieve a 'Triple R' (RRR — rapid runway repair) capability, and it has performed the job at night and in anti-chemical/biological warfare gas masks.

The 40th TG takes the opportunity each summer to display some of the features of its role at Aviano and its singular position as USAFE representatives in Italy during the NATO Day Air Show and Open House. The 1979 event (with 60 aircraft in the static display and a 4hr flying programme) was reckoned to have been witnessed by 500,000 spectators, though such were the traffic 'tie-ups' en-route to the base that while half of this number were accommodated on the airfield, the other quarter million people were off-base out to a five mile radius. So the message for the 1980 show, to be held on 29 June, would be to travel early!

*The other MOBs are: Hahn, Spangdahlem, Bitburg, Sembach, Zweibrücken and Ramstein.

Below: A quartet of F-4D Phantoms from the 614th TFS/401st TFW holding at the end of the Aviano taxiway during a 'last chance' check before take-off.

Facing page: RF-4C Phantom of the 38th TRS/26th TRW on deployment to Aviano from its base at Zweibrucken, West Germany: seen beyond the aircraft are the *Alpi Carnichi* which form a scenic backdrop to the 40th TG's base.
Photos Martin Horseman

History of Aviano AB

The history of the base goes back to the earliest days of Italian military aviation. Together with two other airfields in the Friuli-Venezia-Giulia region (Campoformido located 30 miles east in the suburbs of Udine and Merna located 50 miles east just outside the town of Gorizia), Aviano shares the unique distinction of being recognised as the 'cradle of the Italian Air Force'.

The base was established in 1911 when Italian military aviation was part of the Signal branch of the Army. Available records do not reveal the full progress of operations at Aviano, but it is known that a flying training school was begun in 1912. Air operations from Aviano were conducted during WWI.

In the period between the two World Wars, Aviano Air Base increased in importance as airpower continued to gain prominence in the concept of aerial warfare. During this period both fighter and bomber squadrons operated from the base.

During WW2 the base was used by the Italian Air Force and the Luftwaffe. It was severely damaged by Allied bombing during the latter stages of the war and several years were required to bring it back to operational status. During the early-1950s it was the home of an Italian Air Force wing.

What is now the 40th Tactical Group came into being as Detachment 1, Hq Seventeenth Air Force, in January 1955, and was located in the city of Udine, approximately 70 miles from Austria and 15 miles from Yugoslavia. At that time 17th AF headquarters was located in Rabat, Morocco. The 629th Aircraft Control and Warning Squadron was located at Campoformido Airfield on the outskirts of Udine.

Following negotiations in the autumn of 1954 for the United States to use the base, an advance party of Detachment 1, augmented by personnel of the 629th, arrived at Aviano in March 1955.

This advance party grew steadily in numbers and capability until about a year later it was designated as the 7207th Air Base Squadron, with the mission of supporting and housing operational aircraft. The base became operational on Christmas Eve 1955 when the first rotational squadron of US Air Force F-84F Thunderstreaks touched down on the newly built runway. The arrival of this squadron marked the beginning of US Air Force operations in northern Italy within the NATO defence system.

While in Udine, Detachment 1 had been redesignated as the 7227th Support Group. On 1 July 1957 the 7227th moved from Udine to Aviano, incorporating the 7207th Air Base Squadron. On 1 April 1966 it was redesignated the 40th Tactical Group.

Boeing B-29A *Hawg Wild*

A pictorial postscript on the IWM's recently acquired Superfortress by **Jeremy K. Flack**

THE SUCCESSFUL conclusion of the ferry flight of the B-29A, s/n 44-61748, to the Imperial War Museum (IWM) at Duxford on 2 March marked the culmination of a two-year project to secure an example of the famous bomber for the museum's aircraft collection.

Little is known of this Superfortress' history save to report at the outset that it is a B-29A-45BN, one of a batch of 100 built at Boeing's Renton, Wa plant, which was responsible for the building of the 'Able' variant of the B-29. In all, a total of 3,970 B-29s had been built by the time production terminated in 1946, some 1,100 of these comprising the B-29A version which differed from the B-29 production standard in having a 12in wider span, later marks of the 2,200hp Wright R-3350 engines, and the addition of a four gun forward dorsal turret.

USAF B-29s saw considerable action during the Korean War and it is known that '61748' served with the 307th Bombardment Group during that conflict. At the time the aircraft acquired the nickname *Hawg Wild* from the members of its crew, some of whom hailed from the state of Arkansas. It is reported that the aircraft flew at least 100 missions and there is photographic evidence showing twenty five bomb marks painted on the nose of the B-29. On close inspection some of the bomb markings are visible under the black camouflage. However, just below the cockpit, alongside the technical data block are the remains of revised mission markings. These show five small bombs similar to the original ones and also two larger ones to their left. The two bombs are approximately three times the size of the others and are at an angle of 45°. If the report of over 100 missions is correct then it can be assumed that the large bombs signify 50 missions each and the smaller ones are single missions. Thus *Hawg Wild's* combat mission tally probably reached 105.

One of the aircraft's erstwhile crew members during the Korean War has described *Hawg Wild* as among the luckiest of the B-29s which served in the Far East — it suffered no damage despite the frequent need to run the gauntlet of AA barrages and MiG-15 attacks during its combat sorties.

Top left: Left side nose close-up of the B-29 after its arrival at Mildenhall showing the SAC shield added for the delivery flight, plus stickers from the Naval Weapons Center, the EAA Air Museum, and Aero Services of Tucson Az. The latter company's address is prefaced by the message, 'This aircraft prepared for ferry by the world's most experienced deprezervation specialist'. *Photo: Roger Wright*

Above left: Fin details above the UK registration, G-BHDK, including several repeats of the s/n shown most prominently as 0-461748. *Photo: Roger Wright*

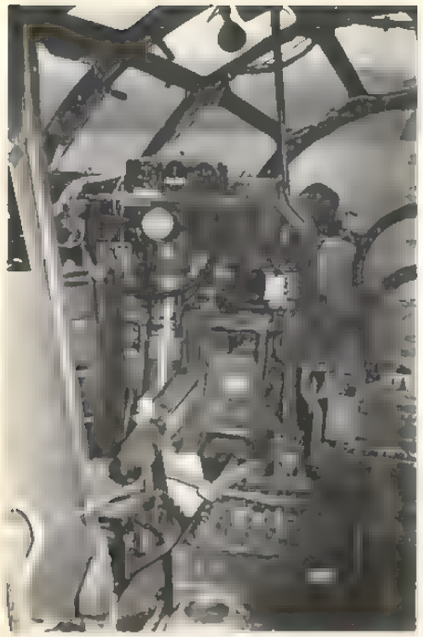
Above: The B-29A Superfortress taxies in at Mildenhall on 1 March 1980 after its penultimate flight from Keflavik. *Photo. Denis J. Calvert*

Right: Three-quarter rear view of *Hawg Wild* in the B-29 graveyard at China Lake, Ca in mid-1979. *Photo: Imperial War Museum*

Colour centrespread overleaf

Boeing B-29A Superfortress, 44-61748, airborne for the last time during its flight from Mildenhall to Duxford on 2 March 1980. *Photo: Jeremy K. Flack*


G-BHDK



Following its return to the US at the end of the war, the B-29 was employed on less hazardous duties as a US Marine Corps target facilities aircraft before being placed into open storage at Naval Weapons Center, China Lake, Ca in 1956. It was there, more than 20 years later, that the Imperial War Museum came across at least 16 examples of the type in various states of dereliction — the occupants of a veritable B-29 'graveyard'.

The US Navy's generous response to the IWM's enquiries was to donate '61748'

to the museum. At this point the problem of how to transfer the B 29 6,000 miles to its final resting place at Duxford began to loom large in the next stage of the project. An expert aircraft engineer, Jack Kern of Tucson, Az was approached by the IWM to dismantle the aircraft and to ship it over to the UK. Jack Kern advised the museum that the cost would be at least halved if the B-29 was restored to its basic flying condition and flown over. This would also rule out the possibility of accidental damage during the dismantling, transport and re-assembly of the Superfortress. The IWM agreed to the scheme for getting *Hawg Wild* airworthy again, and after about seven month's work at China Lake the aircraft was ready to fly once more. On 13 November 1979 a faulty fuel pump prevented the start of a 455 mile sector to Tucson, where some final restoration work was scheduled prior to the delivery flight proper, and an attempt to take-off the following day had to be abandoned to stop the aircraft veering off the runway. At the third attempt, however, all went well and the B-29 arrived at Tucson after a 2hr trip.

It was originally intended to make the ferry flight to RAF Mildenhall with only one stopover, in Gander, Newfoundland, but the flight trials from Tucson indicated that shorter stage lengths would be more appropriate! In due course the long journey began, *Hawg Wild* departing Arizona for Loring AFB, Me on 16 February this year. The B-29's pilot, Skip Cregier, decided on an unscheduled overnight stop at Flint, Mi and the following day a four hour flight saw the aircraft at Loring. The aircraft was delayed for almost a week there by bad weather, and in the course of its stay acquired the insignia of its Strategic Air Command hosts — the 42nd Bombardment Wing, whose shield was prominently observed on the right side of the B-29's front fuselage after its arrival in the UK. By 24 February the weather had improved for the flight to Gander, and that accomplished, the aircraft managed a six-hour stage to Sondrestrom, Greenland the following day. From there the IWM received a telex message that reported the B-29 pilot had been taken to hospital. A telephone call was put through to Greenland where Skip Cregier was indeed in hospital having suffered badly because of a failure of the cabin heating system and enduring a cockpit temperature of minus 30°C en-route

After a night in hospital the pilot was well enough to continue to Keflavik on 26 February, and a 4¼hr flight saw the B-29 arriving at the Icelandic base. Bad weather struck again when gale force winds and icing conditions combined to forestall further progress until 1 March. Eventually the weather broke to allow the crew to take-off for Mildenhall.

Preparations were then made, weather and serviceability permitting, for *Hawg Wild's* final flight from Mildenhall to Duxford. On 2 March the crew went to inspect Duxford's truncated runway, and with the weather holding the aircraft's last brief sortie was accomplished later that day. It was the end of an epic mission and an adventurous postscript to the aircraft's flying career. Now safely recovered from anonymous decline, plans are in hand to restore the B-29 to its former identity as an aircraft of the 307th Bombardment Group.

● In a sad footnote to the story of the Superfortress' delivery to Duxford, it was reported later in March that pilot Skip Cregier was killed in a flying accident shortly after his return to the United States.

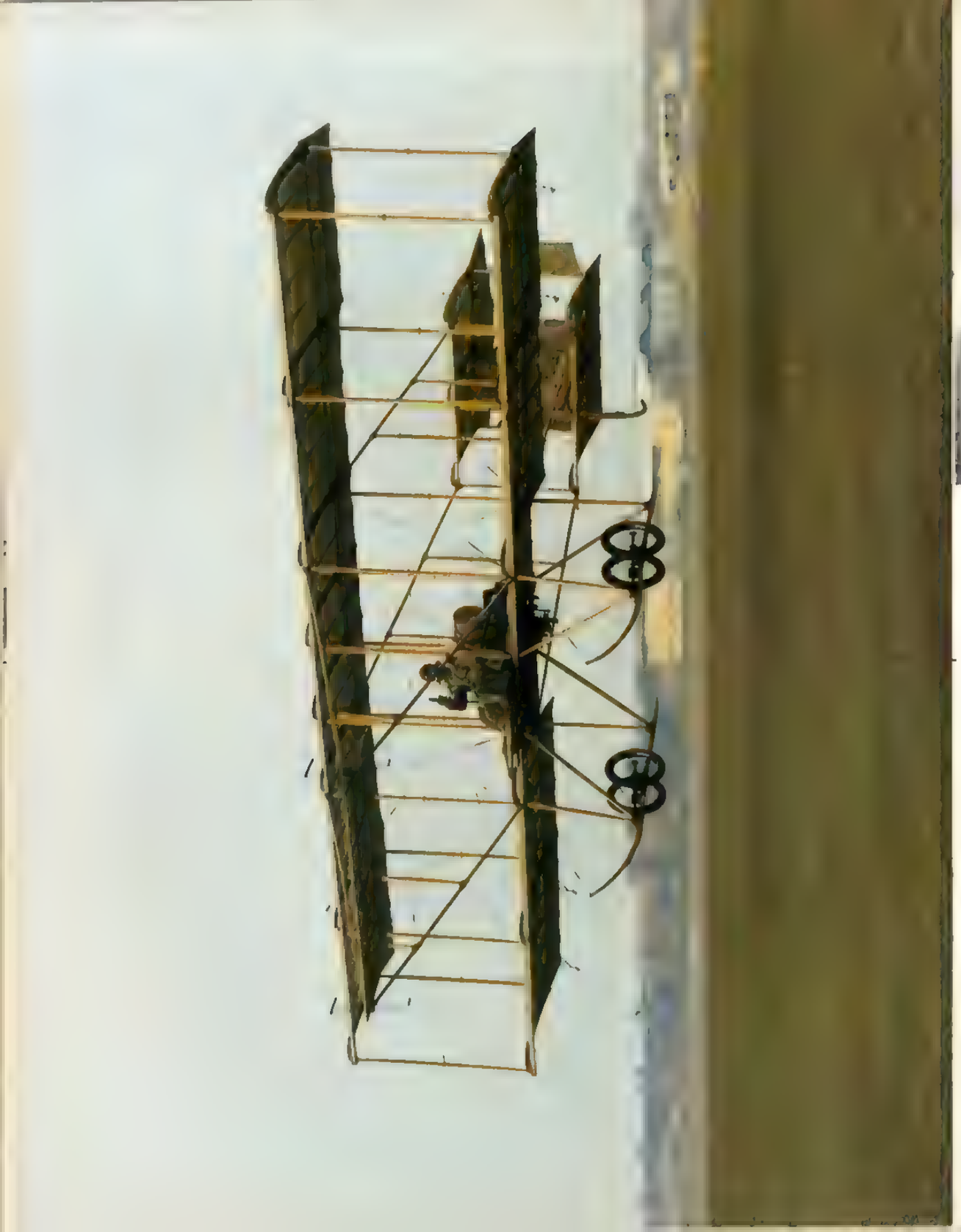
Above: Artist's impression of the B-29A *Hawg Wild* as it will look after restoration in the markings of the 307th Bombardment Group.
Artwork: Melvin Wright

Top left: The aircraft commander's position in the B-29's cockpit.

Left: The flight engineer's station at the rear of the flight deck.

Right: An interior view from the rear bomb bay door looking towards the aft bulkhead and the hatch to the tail gunner's position.
Photos: Jeremy K. Flack

Far right: Pilot Skip Cregier stands alongside the B-29's nose gear after the aircraft's arrival at Mildenhall.
Photo: Denis J. Calvert



FROM BOXKITE TO CONCORDE

70 years of 'Bristol' aircraft.

The first Boxkite emerged from the Filton tramsheds of the British and Colonial Aeroplane Company in 1910. Later this year the last of over 22,500 Bristol aeroplanes built world-wide, will be delivered from Filton and an era of plane-making will come to an end. **Peter R.March** *looks back at some of the highlights of 70 years of Bristol aircraft — from Boxkite to Concorde.*

IN FEBRUARY 1910 an aircraft factory was set up in two sheds in the village of Filton in south Gloucestershire, just north of Bristol. This small works, a former tramcar depot, was the birthplace of a company and a name — 'Bristol'. Today, work still goes on in the two sheds but they are now surrounded by a vast complex of buildings spreading over hundreds of acres of land. Here, some 15,000 people earn their living with the two companies British Aerospace and Rolls-Royce, which now embody the 'Bristol' tradition.

None of this would have existed but for the imagination and drive of the man who began it all in 1910, Sir George White. He was a wealthy Bristol businessman and practical visionary who had already exploited the possibilities of electric tramways and motor buses in Bristol and elsewhere. Sir George was quick to see the potential of the aeroplane, not merely as a sporting vehicle but as a revolutionary form of military and civil transport. He went wholeheartedly into the aviation business and with a world market as his target he named his company the British and Colonial Aeroplane Co Ltd. It was registered on 19 February 1910 with a modest capital of £25,000.

After first buying a Zodiac biplane from France, which he proposed to manufacture, he settled on a copy of the Farman — which was a better design and unlike the Zodiac could be made to fly successfully! The Boxkite, as it was named, was first flown in June 1910 and in September had the distinction of making the first military flight when it was used in a reconnaissance role during Army manoeuvres on Salisbury Plain. Within a matter of months of the first flight the company was planning for expansion and mounting its first overseas sales drive. Missions were dispatched to Australia, India and other countries with good results. In November 1910 the first export order was placed by Russia for eight Boxkites and subsequently aircraft were also sold to Sweden, Spain, France, Italy, Turkey, Romania and Bulgaria.

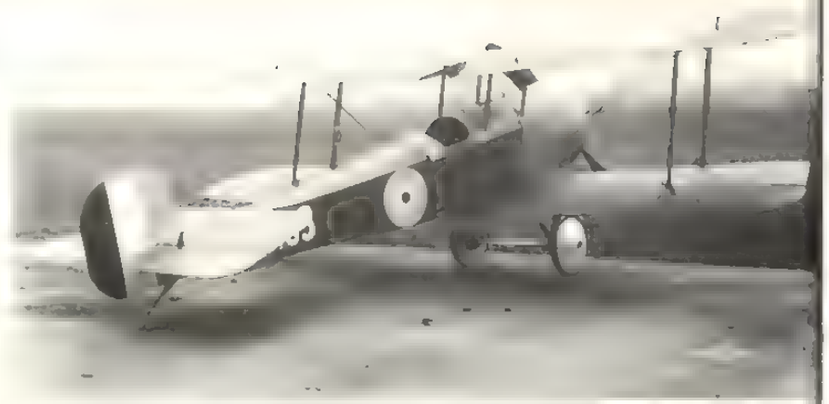
Top: Boxkite No 12, photographed at Larkhill, Wilts, epitomises the early days of the Bristol and Colonial Aeroplane Co Ltd, as it then was. *Photo via the Author*

Facing page: The Shuttleworth Collection's Bristol Boxkite replica, BAPC-2, built in 1964 for the film *Those Magnificent Men in their Flying Machines*, making a nostalgic flight at Filton in June 1968 with Geoffrey Auty at the controls.
Photo: Rolls-Royce Ltd, Aero Division Bristol

To cater for the growing numbers of aspiring pilots the company opened its own training schools at Larkhill and Brooklands. Many men who later became famous as war aces or leaders in aviation first learnt to fly at these schools. It is a measure of the company's predominance in this field that 80% of British pilots available for service when war broke out in 1914 were Bristol-trained.

Well before WW1 Sir George White and his colleagues were trying to convince the British government of the Boxkite's military value. So began a dialogue with Whitehall that has gone on ever since. From 1914 onwards, the development of the company followed a discernible pattern. Periods of explosive expansion in wartime succeeded by periods of difficult readjustment to the less urgent demands of peacetime.

The first Bristol aircraft to be ordered in quantity for war service was the single-seat Scout biplane. It did sterling work as a reconnaissance, training and communications aircraft but it was not designed for offensive operations. Zeppelin raids and the growing ascendancy of the more heavily armed German aircraft over the Western Front pinpointed the need for a genuine fighter. Filton's answer was the two-seat Bristol Fighter F2A, or 'Brisfit' as it was popularly known, one of a long line of successful designs by the legendary Capt F. S. Barnwell. It immediately proved its worth in air battles over France and was one of the outstanding Allied aircraft of the later war years. In total 5,308 Fighters were built in Britain and America, the last one surviving in service, with the RNZAF, until 1938. During the final year of the war the company produced 2,000 aeroplanes from its own factories. By the Armistice the payroll had risen from 200 in August 1914 to 3,000 and the original tram sheds were now part of a factory with eight acres of floor space. Other Bristol wartime designs included the M1C high-wing monoplane fighter and the Braemar four-engined triplane bomber. The M1C



saw service in the Middle East and, operating with the Chilean Air Force, made pioneer flights over the Andes. From the Braemar, which did not go into production because of the ending of hostilities, was developed the Pullman, the first fully enclosed airliner ever built.

There now followed what was in many respects the most difficult decade in the history of the company — re-named the Bristol Aeroplane Company on 9 February 1920. Problems of readjustment and survival were intensified by the general world-wide economic depression that succeeded the brief postwar boom. Diversification was one of the expedients adopted to keep the nucleus of the skilled workforce in being at Filton. Aircraft manufacture was augmented by production of bus and coach bodies and later of motor car bodies. Fortunately the Bristol Fighter was chosen by the RAF in 1919 as the standard army co-operation machine and the construction of new Fighters, together with the reconditioning of existing ones to meet the requirement, brought a steady flow of work.

The Bristol board's decision in 1920 to acquire the Cosmos Engineering Co was to have far-reaching consequences. Led by Mr (later Sir) Roy Fedden, the small group of Cosmos engineers had designed the Jupiter and Lucifer air-cooled radial aero-engines before running into financial difficulties. Once taken over by the newly formed Bristol Aero-Engine Department, these engines were developed to become the first of a long and distinguished line of Bristol engines (the story of '60 Years of Bristol Engine Power' is detailed in *Air Extra* No27 — *Ed*). These products enhanced the reputation of 'Bristol' and, as a result of a number of licence agreements in Europe and elsewhere, contributed substantially to the company's profitability.

It was not until the end of the decade that the next name was added to the list of classic Bristol aircraft. This was the Bristol Bulldog which, in 1929, won a fiercely contested competition for the RAF's standard single-seat day and night fighter. Manoeuvrability and maintainability were two qualities that endeared the agile biplane to pilots and ground crews alike. Nearly 450 Bulldogs were produced at Filton from 1929 to 1934, including a number supplied to foreign air forces.

In the 1920s and 30s Bristol was closely associated with attempts on the world altitude record. During the ten years spanning 1928-1938 the record changed hands nine times and on six of these occasions the aircraft was powered by Bristol engines. Twice, in 1936 and 1937, the special Bristol Type 138 high-altitude monoplane captured the record for Britain

with heights of 49,967ft (15,230m) and 53,937ft (16,640m); a Bristol-engined aircraft also held the record again in 1953 and 1955 when the Olympus powered Canberra WD952 was flown from Filton by Walter Gibb.

In the early-1930s, a design for a fast twin-engined monoplane transport, in which use was made of stressed skin construction, attracted the interest of the then Lord Rothermere. He agreed to sponsor the construction of a development of the design, known as the Type 142 'Britain First'. During official trials in 1935 this monoplane startled Service chiefs by achieving a top speed of over 300mph — some 50mph faster than any fighter then in service. When the Air Ministry asked to retain the aircraft for evaluation as a bomber, Lord Rothermere presented it to the Air Council and thereafter the development of the Type 142 into the military Blenheim proceeded rapidly.

In many other ways 1935 was a turning point for the industry. The government announced in May of that year their plans for a massive increase in the RAF's front line aircraft strength. To meet this challenge, Bristol's directors, realising that the company's capital resources were inadequate, resolved on 15 June to re-organise the firm as a public limited liability company with a share capital of £1.2million. At Filton the erecting shop was doubled in floor area and other extensions included a metal store, toolroom, enlarged machine-shop and a new wing-assembly shop. The speed with which re-equipment decisions were being made and implemented at that time may be judged from the fact that within three months of the Type 142M acceptance trials in June 1935, Filton had received an order for 150 Blenheims.

When war was declared in September 1939 the Bristol Aeroplane Co could claim to have at Filton and Patchway the largest single aviation manufacturing unit in the world. Even so the rate of growth had been insufficient to meet all the demands imposed by the re-armament programme, and to augment the industry's own efforts the Government enlisted the help of the car industry. Bristol products, both aircraft and engines, were among the first to be chosen for production in the 'shadow factories'. The importance of Bristol's contribution was also recognised by the enemy. In a daylight raid on the factories in September 1940, 91 people were killed and more than 100 injured. This hastened the dispersal moves and by 1942, when the payroll had risen to 52,000, over 100 dispersal premises were in use. These included hotels, tobacco stores, chocolate and cider factories and even a prison.

Three aircraft types which together accounted for the great bulk of wartime production of over 14,000 Bristol aircraft were the Blenheim, the Beaufighter and the Beaufort. Blenheims gave valiant service as bombers and army co-operation aircraft in every theatre of war in which the RAF fought. A Blenheim made the first aerial sortie of the war when, on 3 September 1939, a machine of No 139 Squadron made a photo reconnaissance flight over the German fleet in the Schillig Roads. On the following day Blenheims and Wellingtons joined in a mast-height bombing of the pocket battleship *von Scheer*.

Both the Beaufort and Beaufighter owed much to the basic Blenheim design. Until it was superseded as a front line torpedo bomber by the Beaufighter, the Beaufort inflicted heavy losses on the enemy's shipping. Designed to meet the need for a well armed fighter with long-range capability, the Beaufighter will probably be best remembered for its successes in high-level operations over Britain in 1941 when it carried early versions of airborne radar to detect and stalk enemy bombers. Apart from the night-fighter role, it operated with great success as a torpedo bomber and as an intruder armed with bombs and rockets, striking major blows against enemy transport, tanks and other key targets.

Top left: Bristol Scout 'D', N5393, one of a batch of RNAS examples fitted with the 100hp Gnome Monosoupape engine.

Top: Bristol M1C Monoplane (later Type 20), C4910, of 1917; the tailskid support used during this photo session has been touched out of the print.

Left: 'Brisfit' H1688 in pristine condition after its roll out at Filton — the hangars seen in the background remain in use today.

Right: The 14-seat Bristol Type 26 Pullman triplane airliner was a derivative of the Braemar bomber.
Photos via the Author

In the closing phase of the war work was going ahead at Filton on a heavily armed derivative of the Beaufighter, the Buckingham, but hostilities ended before the type had been produced in any substantial numbers. Subsequently a light bomber development, the Brigand, was produced in small numbers for the RAF and was used for close-support duties in East Africa and the Far East. Like many others, the company found itself in 1946 having to cope with the problems of peace time retrenchment and readjustment once again. As before a policy of diversification was adopted and part of the design and production capacity was turned over to such varied projects as cars, pre-fabricated aluminium houses and plastics products.

A helicopter department was set up in 1945 as part of the aircraft division at Filton. Austrian born Raoul Hafner headed a research and development team which produced the Type 171 Sycamore, which was first flown in July 1947. It was later put into production for the RAF and German forces and was the recipient of the first certificate of airworthiness for a British helicopter in April 1949. The twin-engined tandem rotor Type 173 followed in 1952, resulting in the 18-seat Type 192 Belvedere six years later. Helicopter production moved from Filton to the former shadow factory at Oldmixon, Weston-super-Mare in 1955 where the final 83 of 178 Sycamores were built and 26 Belvederes for the RAF. In 1960 Westland Aircraft took over the Bristol Helicopter Department and the factory is today producing Pumas under the Westland company title.

An immediate postwar civil aircraft project was to hand in the Type 170, a freighter derived from the Bombay military transport, an aircraft that had been designed by Bristol before the war and built by Shorts at Belfast. The Type 170, better known as the Bristol Freighter, or in the passenger version, as the Wayfarer, certainly proved itself a useful workhorse. A total of 214 was built between December 1945 and March 1958 and served in all parts of the world, the largest number going to the Pakistan Air Force. Many thousands of people had their first experience of air travel in the 1950s and 1960s flying with their cars in the hold of the Freighter on Silver City (later British United) car ferry services to and from the Continent. Just a handful remain airworthy today in New Zealand.

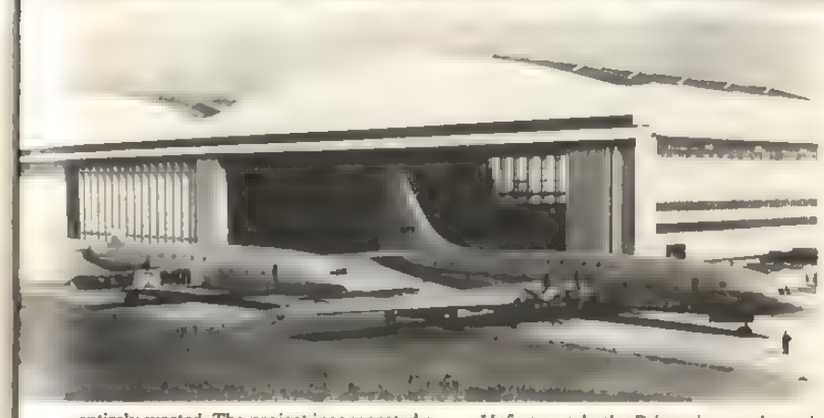
Far more ambitious was the Brabazon, a large trans-Atlantic airliner project designed to meet one of the postwar requirements formulated by the Inter-Departmental Committee under the chairmanship of Lord Brabazon of Tara. This committee was set up in 1943 to decide on the types of aircraft likely to be needed after the end of the war. Filton's submission for an eight-engined, 160-ton aeroplane drew extensively upon design studies that had been made in 1942 for a long-range bomber. In 1945 the company was awarded a contract and construction of the prototype commenced in October that year. Many problems were encountered during the next four years leading up to the first flight on 4 September 1949. There was extensive testing of design innovations both on the ground and in the air. The huge Brabazon Hangar was built at Filton to accommodate the assembly of the two prototypes and a new runway was laid, involving the demolition of a village and closure of a dual carriageway. The only aircraft to be completed, G-AGPW, had flown only 400hr when it was decided to abandon the project in 1953. Structural and flight control problems associated with gust alleviation were behind the political and financial decision to scrap the giant.

The Brabazon experience was not entirely wasted. The project incorporated a design philosophy which was later used to introduce new standards in the techniques of aircraft construction. This was put to good effect in the Type 175 Britannia, the first turbine-powered airliner to provide a non-stop service over the North Atlantic. The Type 175 began as a Medium Range Empire (MRE) design to meet BOAC requirements set down in MoS Specification 2/47. Prototypes were ordered in February 1948 and the first of these was airborne at Filton on 16 August 1952, powered by Bristol's new Proteus turboprop.

Unfortunately the Britannia was dogged by development problems and bad luck. The second prototype was lost after only 51hr flying and a major engine fault delayed entry into service with BOAC until February 1957. Nevertheless in ten years of operations by the national airline it had an exemplary safety record, not a single passenger was killed or injured in the 135 million miles covered. It had a similar impressive record as a transport in service with the RAF from 1959. A small number of the 85 Britannias built at Filton and by Shorts at Belfast remain in operation today with cargo airlines.

A postwar development of great significance was the company's entry into the guided missile field, following the establishment of the Guided Weapons department in 1949. After intensive research, involving rocket-range tests in this country and at Woomera in Australia, the Bloodhound surface-to-air guided weapons system was adopted by the RAF. The Mk1 version entered service in mid-1958 code-named 'Red Duster' and it was later followed by the improved Mk2 which remains in front line use today. More recently the company has extended its activities to satellite and other space-age technology. Although still located at Filton the missile and associated products are now controlled from Stevenage, Herts by the Dynamics Group of British Aerospace.

The list of 'Bristol' prefixed aircraft ends with two purely research aeroplanes, the Types 188 and 221. Both furnished valuable information on the structural and aerodynamic problems associated with supersonic flight. The stainless steel 188, of which two examples were built and flown, highlighted the difficulties of working in this somewhat intractable material and the experience so gained undoubtedly helped influence the choice of aluminium alloy as the main structural material for the Concorde that was to follow. The Type 221 was a modified version of the record-



Above: Night fighter, torpedo bomber, and ground attack intruder, the Beaufighter proved to be a versatile multi-role performer during WW2.

Above right: Bristol Type 170 Mk21 Freighter in the markings of Silver City Airways; the aircraft gave sterling service on the car ferry operations to and from the Continent. *Photos via the Author*

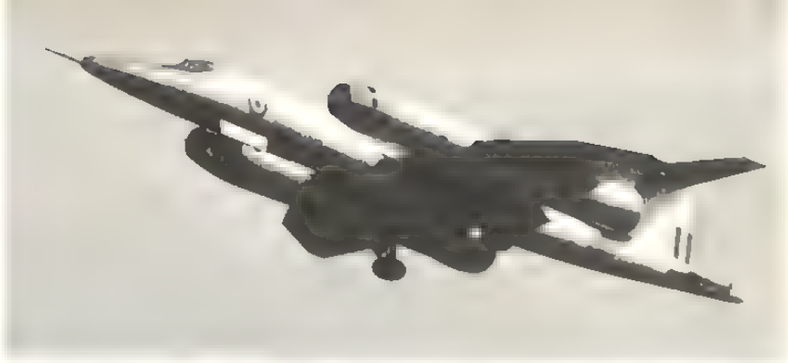
Right: The end was in sight for the Brabazon at the time this photograph was taken — the Mkl aircraft, G-AGPW, and the part complete MkII, G-AIML, at Filton in October 1953 just before they were scrapped.
Photo: Rolls-Royce Ltd, Aero Division Bristol

Below right: The RAF's first Britannia C1, XL635 *Bellatrix*, at Lyneham.

Below: Sycamore HC14, XG504, was operated by No 32 Squadron, the last RAF unit to fly the type.
Photos: Peter R. March

breaking Fairey Delta 2 and used to investigate the handling and control characteristics of the slender ogival wing, which was again to feature in the Concorde.

In the late-1950s the Bristol aircraft design team, under the leadership of Dr Archibald E. Russell (now Sir Archibald), was awarded important MoS contracts for design and feasibility studies in the development of a supersonic transport. After an outline design for a thin delta wing with pencil fuselage had been accepted, the Bristol Type 198 was projected. This would have been a trans-Atlantic-range delta aircraft powered by six Bristol Olympus engines. The government decided that this 380,000lb machine was too heavy and asked for a smaller design, capable of carrying 100 passengers across the Atlantic, with a maximum weight of 250,000lb. This resulted in the Type 223 which formed the basis for the British contribution to the collaborative venture with France which was agreed in November 1962 and resulted in Concorde.



Above right: Bristol Type 188, XF923, takes off from Filton for its maiden flight on 14 April 1962 — note the mainwheel re-positioning prior to retraction.
Photo: Peter R March

However by the time that Concorde was beginning to take shape on the drawing boards at Filton and Toulouse the name of 'Bristol' had already disappeared from the aircraft company's heading. Back in January 1956 the Bristol Aeroplane Company had reorganised into three wholly owned companies: Bristol Aircraft Ltd, Bristol Aero-Engines Ltd, and Bristol Cars Ltd. Four years later Bristol Aircraft Ltd joined with Vickers Ltd and English Electric to become the British Aircraft Corporation. The Helicopter Division was taken over by Westland Aircraft. On 28 December 1963 the separate companies merged their identities and Bristol Aircraft Ltd became the Filton Division of BAC. Four years later the Bristol title was lost from the engine side when Bristol Siddeley Engines Ltd became the Bristol Engine Division of Rolls Royce Ltd. The nationalisation of the aircraft industry in 1977 resulted in the formation of British Aerospace (BAe) and the works at Filton became part of the Weybridge-Bristol Division of BAe Aircraft Group while the BAC Guided Weapons Division at Filton became part of the Stevenage-Bristol Division of the BAe Dynamics Group.

Today there are about 4,500 people employed on the aircraft side at Filton, engaged in work on the Airbus, the new BAe 146 airliner, conversion of VC-10s as tankers for the RAF and maintenance of F-111s for the USAF. Just one Concorde remains to be finished and delivered to British Airways later this year. This is the last whole aircraft to be assembled and flown from Filton, at the end of a line of over 15,000 machines of 86 different designs which began way back in 1910 with the Boxkite. 1980 sees the end of an era for the planemakers of Bristol.

Below: Another airborne debut seven years later — Concorde 002, G-BSST, at the start of its inaugural flight from Filton on 9 April 1969.
Photo: BAe Weybridge-Bristol Division, Filton

TAC HeavyLift -belief in the Belfast

Allan Burney

IN THESE DAYS of harsh economic realities many airlines, both old and new, small and large, are finding profitable operation an ever increasing problem. One particular market for commercial aircraft employment that has encountered growing difficulties is that of pure freight operations. Over the last decade non-specialist airline use of wide-body aircraft, with their increased flexibility for freight/passenger traffic, has sounded the death knell for many of the less viable air cargo carriers. This trend has been mirrored in recent years by subsequent airline mergers and sometimes, more drastically, by closures — the recent demise of British Cargo Airlines being a good case.

However, despite this general recession in the market, a new UK freight airline — TAC HeavyLift Ltd — has entered the ranks of specialist cargo airlifters and, following the granting of the civil Certificate of Airworthiness to its Shorts Belfast aircraft on 6 March 1980, it started operations later that month.

Stansted-based TAC HeavyLift Ltd is an independent airline which was first incorporated in 1978 and is jointly owned by the Cunard Steam-Ship Company (⅔ share) and Eurolatin Aviation (⅓ share). The airline believes that it has found an appropriate and profitable niche in the saturated air freight field — dealing with large awkward outsize loads beyond the capability of standard civil wide-body types. This was a sentiment echoed by TAC HeavyLift's managing director, Capt P. J. McGoldrick, during his speech at the certification presentation ceremony at

Below: The business end of the Belfast — TAC HeavyLift's first aircraft, G-BEPE, displays its cargo loading ramp at Stansted in March 1980.
Photo: Allan Burney

London-Stansted airport, when he commented: 'We wanted a different aircraft to fulfil a different requirement. In our opinion the Belfast is that aircraft'.

The Shorts Belfast was originally built for the RAF in the 1960s and although the manufacturer initiated a civil certification programme, of which approximately 65% was completed, this was cancelled due to apparent lack of interest displayed by commercial carriers at that time.

The development of the Belfast was initially based upon that of the Bristol Britannia — the design was for some time dubbed the Britannic, and the RAF finalised a contract for 10 of the type to serve in the strategic, heavy airlift role. The aircraft that was eventually evolved bore little resemblance to the original concept and utilised only some of the Britannia's basic wing structure. Following a protracted development which spanned four years, the first Belfast made its maiden flight on 5 January 1964 and deliveries to the RAF commenced on 20 January 1966, when the first CMk1 was handed over to No 53 Squadron at Brize Norton. As a result of defence cuts at the end of 1976, the RAF phased out Belfast operations and, on 23 March 1977, Eurolatin Aviation concluded the purchase of the aircraft. At this stage in their career the Belfasts had flown 23 million nm without incident, averaging 8,000 flying hr/airframe. Of the original 10 aircraft, four have been scrapped, one is destined for display with the RAF Museum and TAC HeavyLift has access to the other five.

On obtaining the aircraft, the airline completed an investigation to ascertain the oustanding conditions for Civil Aviation Authority (CAA) approval and following the go-ahead decision for certification, they enrolled the aid of Marshalls of Cambridge to provide the design and flight test support for the Belfasts under the organisation's existing CAA approvals. An independent engineering base at Southend airport was set up to carry out modifications required by the programme and to organise the management, identification, certifying and transport of spares for the fleet.

The Belfast civil certification programme involved a cost of over £4 million and included 120hr of flight testing; 20,000man/hr of design; 25,000man/hr of aircraft engineering; a complete assessment of all aircraft systems; civil certification of the Rolls-Royce Tyne engine; production of civil maintenance schedules, flight operating and technical manuals; and design, manufacture and installation of modifications to the radio station, navigation equipment and the aircraft's compulsory 'black boxes', cockpit voice recorder and flight data recorder. Additional tasks were the removal of both the Belfast's RAF automatic landing system (the type became the first military transport in the World cleared for 'hands off' autolanding in fully operational conditions), and in-flight refuelling equipment.

At the time of going to press only one of TAC HeavyLift's fleet had been certificated, the example being registered G BEPE (ex-XR362), although a further two aircraft, G BEPS and G BFYU, are scheduled to be incorporated into service at three-monthly intervals (June and September) should the need arise. It is thought more likely, however, that the third aircraft will not enter service until late this year. It is understood that the two remaining examples will be held in reserve and primarily utilised as spares.

The dimensions and specifications of the Belfast are impressive and its cavernous hold has a volume of 11,000ft³ with a cross section minimum of 12ft×12ft. It is capable of carrying up to 34 tons of freight — although at this weight its range is a very limiting 700 800nm, and it has a cruising speed approaching 330mph.

Future 'outsize' business anticipated by TAC HeavyLift include that from the oil related industries, aerospace contracts, military and relief organisation airlift requirements, transportation of portable buildings, film units ... etc, while perhaps other cargoes could include furniture, flowers and livestock. G-BEPE is already heavily committed and during its first two months of operation it was scheduled to ferry defence equipment for Marconi, fly construction parts to Southern Libya and deliver a series of new helicopters (reportedly Sea Kings) to Cochim, India.

The undeniable admiration and faith expressed in the Belfast by the management team of TAC HeavyLift is much in evidence but beneath the enthusiastic optimism lies a strong belief that the airline can succeed and make a profit in the outsize air cargo market; there is, moreover, an optimism that the existence of the airline will extend beyond the lifetime of its current equipment — even though the estimated airframe life of a further 70,000hr could enable the Belfast to continue operations to the turn of the century!

Above left: One of the TAC HeavyLift Belfasts airborne during the certification trials, which were completed in March this year. The aircraft's average cruising speed with maximum payload is 275kts (510km/hr). *Photo: TAC HeavyLift*

Above: A view down the Belfast's freight hold towards the loading ramp: the hold's maximum width is 16ft 1in and maximum payload is 75,000lb (34,000kg).

Top right: From nose to tail cone the Belfast is 136ft 5in in length and the fin towers 47ft above the ground.

Above: Starboard side view of G-BEPE showing the built-in crew boarding stairs.

Below: The 'versatile giant', as TAC HeavyLift has dubbed the Belfast, dominates the Stansted skyline. At 158ft 10in the aircraft's wing span is over 20ft greater than its fuselage length. The four underslung engine nacelles house Rolls-Royce Tyne RTy 12 turboprops each developing 5,730eshp. *Photos: Allan Burney*

airkits

James Goulding

An old friend

Now in its 15th year the DC-9 twinjet transport has been developed in many forms, these varying from the familiar DC-9 srs 30, through additionally stretched versions like the srs 40 and srs 50, to the much elongated new Super 80 — with its fuselage stretched still further to give an overall length of 147ft 10in. The srs 30 version of the airliner, is probably the most widely used of the DC-9 family and it is pleasing that Heller has selected this version for their 1:125 scale kit of this attractive aircraft.

It is a very nicely moulded model, with superb external engraving. Surprisingly there is no cockpit detail and, while agreeing that the cockpit windows are small, I feel that some rudimentary components would have been an advantage for those modellers who like to add detail. Although small the wheels have good engraving, and the engine turbine fronts add to the appearance of the model. Window transparencies are provided.

This kit is produced in the markings of KLM, as is the case in Airfix's DC-9 srs 30 in 1:144 scale. Revell, too, produce a DC-9 in KLM markings. One could be forgiven for thinking that KLM is the only DC-9 operator! Heller's DC-9 costs £3.10.

Airfix's new 'Flogger'

Kits of Russian aircraft have become more popular, and the manufacturers have taken the risk and produced more to meet demand. It will be interesting to see if the renewed East-West crises will reverse this interest or whether the demand for new kits will be maintained. Certainly, I feel it would be a pity if the production of new kits was halted, and I am still hopeful that some of the well-known types will eventually be seen in our model shops.

Any model of a Soviet aircraft is a manufacturer's personal interpretation of photographs, coupled with dimensional data which may or may not be correct — some of the information varies quite considerably between sources. Dimensionally, Airfix's MiG 23 kit seems to be based on data appearing in one publication which gave the overall length, including the pitot head probe, of approximately 55ft, whereas a recently published general arrangement drawing gives an overall length, including probe, of 59ft 10in. Airfix's model represents the MiG-23 as being smaller than one would expect in a versatile general purpose fighter in the Phantom class, and it will be interesting in later years, as more authentic dimensions become available, to find out which assessment is correct. Compared with the three view drawing, Airfix's 1:72 scale model has a similar wing span, is considerably shorter and has a much smaller fin and rudder. A photograph taken during the flying display given in the course of a visit to Finland by six MiG-23s in 1978 showed that the wing span is shorter in comparison to the overall length than appeared in published drawings — and in this regard, the length of 59ft 10in may well be correct.

It should be noted that the Airfix kit of the MiG-23 was far advanced in development before the Soviet AF visits to Finland and France two years ago and new data have become available as a result of those deployments. A study of the excellent photographs taken on those occasions (see *Aircraft Illustrated*, December 1978, pages 596-601—*Ed*) reveals a subtle underline to the forward fuselage, curving gently upwards towards the radome — in its turn the latter is tilted slightly downwards. Although the Airfix model has a generally downwards tilt to the radome, the change of contour under the fuselage is lacking. As the bottom line of the under fuselage gently curves up to the radome on the model, this suggests that the radome should be a little larger in diameter.

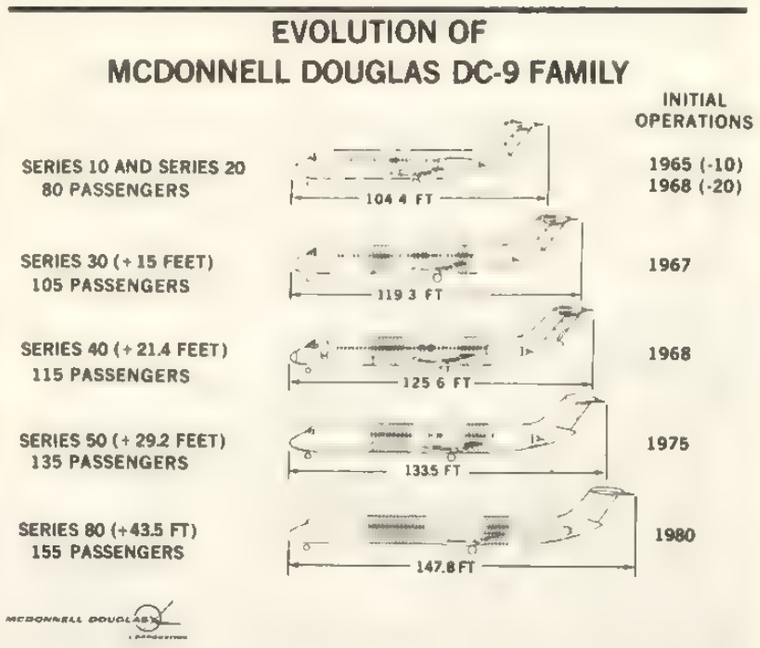
Within the kit's limitations, including the proviso regarding overall size, it can be made into a pleasing model. The standard of moulding and fit of parts is good, but I do not like the inclusion of the front fuselage as an integral moulding with the wing pivot glove. This results in a horizontal joint line through to the tip of the radome, which means the loss of detail on the sides of the fuselage during the sanding of the joint. Presumably this has been done to save costs, but I feel it would have been better if only the radome had been a separate component.

One of the interesting features of the MiG 23 design is the ingenious main undercarriage and its retraction system. The main gear legs have a wide track yet fold into a small area in the fuselage between the air intake ducting and the outer skin. On the Airfix model these main units have been nicely moulded, but they are rather delicate and care must be taken not to put the model down heavily.

Stores included in the kit are four K-13 Atoll missiles and two AA-7 Apex missiles, one with infra-red head and the other radar guided. The export version carries the simpler armament of four Atoll missiles, whereas Soviet Air Force aircraft usually carry two Atoll and two Apex missiles. An under-fuselage fuel tank is also included in the kit.

The decal sheet gives markings for two Soviet AF aircraft and for a 'Flogger E' of the Libyan Air Force.

Above: Painted in the colours of Austrian Airlines, the third DC-9 Super 80 (N1002W) joined the flight test programme for the type on 29 February 1980 with an initial 3hr flight from Long Beach Municipal Airport, Ca to the flight development facility at Yuma, Az.



New colours

Some time ago I went into my local newsagent and noticed a rack of Gloy paints, some samples of which I bought. Trying these out, my conclusions were that the results were a little disappointing and they did not offer any advantage over existing model enamels. The news that Gloy was going to introduce a range of authentic aircraft and railway paints raised in me only mixed feelings — thoughts that a new range of really accurate colours would be desirable, but that we have had other paint ranges with colours that often needed mixing to produce the true shades.

I have now received samples of all the new aircraft colours produced by Gloy and my opinion of the colours tested so far, and it is quite a substantial number, is that they are superb and an exciting addition to our modelling inventory. The paints have excellent covering qualities and produce a beautiful finish. As with all model painting the best finish is obtained by applying two thinner coats rather than one thick coat, allowing ample drying time, say 24hr, between coats. The Gloy paints seem to require a somewhat longer drying time before a model is safe to handle than do some of the familiar enamels, but this probably contributes to the very smooth brushed finish that can be achieved.

The matt paints have a realistic slight sheen, which looks much more authentic than the very 'flat' finish of some paints, and it seems that a slightly higher gloss has been introduced into those paints representing shades with specific applications. The German colour — *Hellgrau 63*, for instance, had numerous prewar applications, usually with a fairly shiny finish, and Gloy's version seems to have a little more sheen than the wartime colours.

Testing the accuracy of the various paints, for which I have authentic colour samples, the results have been impressive and it is evident that much research and care in matching has gone into these paints. An example of this is the Fighter Command colour, Ocean Grey (the true MAP shade). Unlike the mixed grey (Medium Sea Grey and Night) used from Mid-1941 until generally replaced by Ocean Grey, the latter shade is a most subtle colour and very difficult to match. It is made up by mixing white, black, blue and yellow, and my colour references for the correct shade are a true wartime sample and accurately matching the example contained the useful book *British Aviation colours of World War Two*. The Gloy version is a splendid match, and the first accurate representation of Ocean Grey available to modellers. It is a long-overdue colour for accurately portraying a British fighter of the later WW2 years. The other colours used in the standard British, Dark Green, Medium Sea Grey and Sky are also excellent in colour match.

Eighteen RAF colours are in the Gloy range, including most of the familiar wartime shades. Two surprising omissions from the RAF range are Dark Sea Grey and Light Aircraft Grey. Dark Sea Grey was used on the upper surfaces of the lower wings of maritime biplanes (in conjunction with Light Slate Grey, another serious omission) and could be used by modellers to represent the mixed grey used by Fighter Command. Dark Sea Grey is also, of course, one of the most widely used of colours in the RAF today. Light Aircraft Grey is another important modern colour. Light Slate Grey, apart from its use as a camouflage colour, was also the main colour for code letters on white Coastal Command aircraft. A very pleasing colour in the RAF range, especially with the impending release of Matchbox's Handley Page Heyford, is the prewar night bomber finish, Nivo. Four identification colours are included for national markings, these being the prewar Bright Red and Bright Blue and camouflage scheme Dull Red and Dull Blue. Matt Black is available, but paint manufacturers have not yet produced a representation of Special Night (RDM2), the very sooty undersurface finish for night flying aircraft (and overall finish for night fighters) from 1939 until 1942.

There are 21 colours in the USAF and USN range, which include all the basic colours used by the two American services during WW2. Unfortunately, the present day American colours have not as yet been listed, but I hope these will be added before long.

The 21 *Luftwaffe* colours cover all the main shades used during the prewar and wartime periods. In addition to the aircraft colours there are 63 railway colours, some of which will have applications in aircraft modelling, which include Copper and Brass (for old aircraft), Polished Steel, Oily Steel, Unpainted Steel and Aluminium Alloy.

The present recommended retail price of all these paints is 27p per tin.

air view

Peter R. March

Newbury Air Festival

There can be few major air shows that have experienced such a difficult gestation as the Newbury Air Festival. First planned for Bristol-Lulsgate Airport, moved to Bristol Filton and with only nine weeks to go relocated to RAF Greenham Common, Newbury it has had to overcome almost insurmountable problems. This could be a factor in making the Air Festival one of the most entertaining and contrasting shows to be held this year as the keen band of volunteers who make up the IAT organising committee are determined to maintain the reputation that they have won for presenting Europe's best air displays.

The Festival was first planned at the request of Bristol City Council, to celebrate the 50th anniversary of the opening' of the municipal airport at Whitchurch on 31 May 1930. Detailed arrangements had been made by November 1979 for the event to take place at Bristol (Lulsgate) Airport, but it soon became clear that the conflict of commercial operations and a major air show could not be easily reconciled. Following discussions with the Civil Aviation Authority the organisers decided to seek an alternative venue.

Nearby Filton Aerodrome with its long runway, extensive parking areas and close proximity to motorways and main railway lines was an ideal replacement. Operated by British Aerospace, this Government owned airfield had previously been the location for major RAFA displays in the 1960s and occasional company shows in the 1970s, all of which had attracted good aircraft participation and very large crowds.

The Bristol International Air Festival at Filton was given the go-ahead by the Board of British Aerospace in December 1979 after the submission of detailed written proposals by the RAF Benevolent Fund, which was to be the beneficiary of the event. Important features of the Festival were to be special displays to mark the 70th anniversary of Bristol aircraft from the 1910 Boxkite to the Concorde, and 60 years of Bristol aero engines. The Bristol Aerial Derby, the name used 50 years previously for a handicap air race at Whitchurch, was being sponsored by Jeep as part of the year's National Air Races.

However, just ten weeks before the event was due to take place the Board of British Aerospace with great regret informed the RAF Benevolent Fund that they had decided to withdraw their permission for the use of Filton. The official reason being given 'that it had grown too large for the airfield'. A puzzled and disheartened IAT committee looked back at the plans they had submitted, which had not been changed since their presentation, and counted the cost of their efforts to date. A large sum of Benevolent Fund money had been committed with advertising material printed, accommodation booked, communications networks laid and above all some 20,000 man/hr put into the project. A huge team of volunteer helpers had been recruited with the aid of local Rotary, Lions and other charity organisations, none of whom would now be required. The cost of cancellation itself was huge.

Once again a search was made for an alternative airfield in the area that could fill the gap. Unfortunately every avenue that was followed presented insuperable problems with one significant exception, RAF Greenham Common. IAT's home airfield. Although 70 miles from Bristol it had the advantage that the volunteer committee could use their experience of the 1979 Air Tattoo to mount an event in the short time available.

A detailed feasibility study started on 22 March and when completed five days later showed that it would be possible to stage an air festival at Greenham Common on 31 May and 1 June. The support for the venture was quickly forthcoming from the USAF, operators of the base, the RAF, Army and Royal Navy and the many organisations in the Newbury area without which it would not be possible to go ahead. The SBAC, who organise the Farnborough Air Show in September, were informed by IAT of the need to move the event to Newbury. There could be no conflict here as the displays would be three clear months apart and would be very different in character.

With all the preliminaries completed in record time and continued support from the many air arms, companies and private pilots who had agreed to participate at Bristol, it was announced on 1 April that the Newbury Air Festival would go ahead at Greenham Common. Unfortunately there had to be some casualties. The Jeep air race had to be abandoned as a suitable course could not be found. The Bristol Boxkite to Concorde display was impracticable at the new venue. However, two new themes of wide interest have been introduced to replace them, both reflecting the historic and contrasting elements of the Festival.

In 1910, the son of the Vicar of Crux Easton, near Newbury, took his first steps towards establishing a name soon to be famous in British aviation. His name was Geoffrey de Havilland and the occasion was his first flight in an aircraft he had designed and built himself. The place was Beacon Hill, three miles away from Greenham Common. To mark this significant event the Air Festival will have a static display of de Havilland aircraft from early Moths of the 1930s to the Comet airliner of more recent years.

The Royal Air Force Benevolent Fund has obtained much needed income for its work from the proceeds of major air shows. Since 1976 these have been the

Above left: Following the exchange visit between No 311 Squadron RNethAF and No 5 Squadron RAF on 21-31 March 1980, one of the Dutch unit's F-104G Starfighters was seen at Volkel AB with the RAF Squadron's fin insignia added to its own.
Photo Ben Ullings, Aviation Photos International

Above: The scene at Finmere, Bucks during the Vintage Aircraft Club's Daffodil Rally on 6 April 1980.
Photo: Trevor Holmes

Below right: Becoming part of the scenery at Shoreham, Caribou 5H-MRQ. *Photo: Graham Finch*

International Air Tattoos held at Greenham Common and the Air Festival held at Bassingbourn in 1978. However, the Fund's interest goes back to the first Royal Air Force air display, or aerial pageant as it was described, which took place at Hendon on 3 July 1930. Like the contemporary events the Hendon Air Pageant was a huge success. *Flight* commented that it put pre-war aerial race meetings in the shade and another report stated that 'for the first time on record the British public were able to witness an exhibition of almost every phase of modern aerial warfare'. At the end of the day the Fund's income amounted to more than £6,700, a considerable sum at 1920 prices. To mark the 60th anniversary of the first Hendon pageant the Newbury Air Festival will present its own mini pageant in the flying programme. This will include such items as the Fairey Flycatcher and Swordfish, Gloster Gladiator, Spitfire, Hurricane and Messerschmitt Bf108.

With over 150 machines taking part in the extensive ground exhibition and flying display, ranging from micro-light powered hang gliders to the huge C-5A Galaxy and Pitts aerobatic teams to the Red Arrows in their new Hawks, there will be something of interest for everyone. In contrast to the Air Tattoos the accent will be very much on variety. Although 15 different air arms will be participating there will also be a much bigger input of civilian aircraft. The daily programme will commence soon after 09.00hr with displays by hot-air balloons and hang-gliders. The main flying programme will start at 11.00hr each day and will run for six hours. It will include, subject to operational conditions, such items as a Danish F-100 Super Sabre, Norwegian P-3B Orion, French Mirage F1, Canadian F-104 Starfighters, a Dutch Atlantic, Austrian Saab 105s, Portuguese Cessna T-37s, a German Transall and a host of UK service aircraft. The organisers hope that Concorde 002 G-BBDG will also be present. This will be a major event in the 1980 air events caldendar which deserves success after the huge difficulties it has had to overcome.

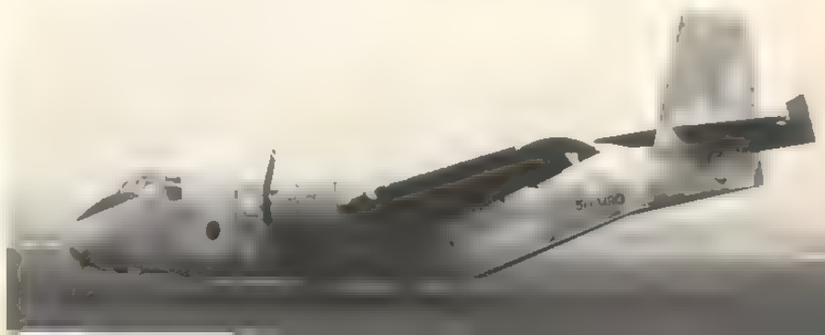
Round and about

As widely reported the first Jetstream 31 G JSSD made its maiden flight from Prestwick on 28 March (see 'airnews' item, this issue—*Ed*). This aircraft is under consideration by the RAF, along with the Beech Super King Air 200, for the Devon replacement programme. An important factor will be the time scale for the initial development work and full production by British Aerospace. Prestwick continues to see deliveries of Israeli built aircraft en route for South America. During March three Aravas passed through for the Columbian Air Force (FAC952 on 8 March, FAC951 on 12 March and FAC 953 on 14 March). Westwinds also take this route across the Atlantic for delivery to the USA. Crew training at Prestwick still includes new Boeing 737s, this time Orion's G-BGTV, 'GTW and 'GTY from East Midlands.

On the south coast several airfields have become repositories for aircraft in enforced retirement. At Hurn three of British Cargo's DC 8s are in open storage pending a decision on their future. G BFHW, G BSKY and G BTAC all arrived during the first half of March. At the same airfield Islanders S7-AAJ and S7 AAH have been awaiting sale for some time. Along at Shoreham Caribou 5H-MRQ has become part of the scenery and is believed to be one of nine that Tanzania is waiting to sell. Two Twin Otters were also present on 23 March, A6 MRM en route for Emirates Air Service and 5A-DDC for Libya, both departing a few days later.

We do not often report the first flight of a home-built, full size hot air balloon. Peter Bish of the Dante Group at Marsh Benham tells us that Kevin Hendry's Amethyst Ax-6 G-BFLP was coaxed into the air for the first time on 12 January, piloted by himself and accompanied by the builder. It is a 56,000ft³, 12 gore balloon with a burner designed by Geoff Payne and the basket made by the Blind Work shops at Reigate. It took Kevin and his wife Betty three years to complete the work.

The likelihood of the Queen's Flight receiving BAe One-Elevens in the future



air events '80

UK update

The following list details the air events scheduled to take place in the British Isles during the next four weeks (mid-May to mid-June). Readers are advised that they should check with organisers before setting our for an event that it is still to be held on the date shown and at the venue listed.

May

15-18 Hanover Flying Club visit to Bristol, Lulsgate, Avon
17 Brighton Festival Tattoo (Red Arrows display), Brighton, W. Sussex
17-18 International Air Fair, Biggin Hill, Kent
17 18 McAully Aerobatic Competition, Little Snoring, Norfolk
18 Mosquito Museum Open Day, Salisbury Hall, St Albans, Herts
18-20 Open Days, Royal Scottish Museum of Flight, East Fortune, Lothian
23-25 British Precision Flight Championships, Redhill, Surrey
24 Red Arrows Display, Congleton, Cheshire
24-25 Practice Flying Days, Strathallan, Tayside
24-26 Vintage Aircraft Club Spring Camp, Boston, Lincs
24-26 Navy Days, Chatham, Kent
24-2 June — Arctic Lite Gliding Championships, Dunstable, Beds
25 Red Arrows Display, Corby, Northants
25 Shuttleworth Flying Day, Old Warden, Beds
25 Air Display, Long Marston, Warks
26 Air Day, Dunkeswell, Devon
26 Fly-in, Compton Abbas, Dorset
26 Open Day, RAF Henlow, Beds
29 Open Day, RAF Brawdy, Dyfed
31 Families Day, RAF Wyton, Cambs
31 Red Arrows Display, St Neots, Cambs
31-1 June — Newbury Air Festival, RAF Greenham Common, Berks
31-1 June — Air Squadron Aerobatic Competition & Display, Old Warden, Beds
31-1 June — Light aircraft fly-in and camp, Bagby, N. Yorks
31-1 June — Highland Aero Club Fly-in, Glenforsa, Mull

June

1 Red Arrows Display, Burnley, Lancs
1 Vintage Aircraft Club Fly-in, Shotteswell, Oxon
2, 4 & 6 — Red Arrows Displays, Isle of Man TT Races

Above: Amethyst Ax-6, G-BFLP, at Marsh Benham just before its first flight on 12 January 1980. *Photo: Peter J. Bish*

7 Manchester Air Show, Barton, Lancs
7 Open Day, RAF Waddington, Lincs
7 Families Day, RAF Honington, Suffolk
7 British Aerospace Open Day, Broughton, Cheshire
7 Open Day, RNAY Fleetlands, Gosport, Hants
7 Shuttleworth Flying Evening, Old Warden, Beds
7-8 4th International Competition Weekend, Leicester Airport, Leics
8 SSAFA Air Display, RAF Church Fenton, N. Yorks
8 Air Display, Blackpool Airport, Lancs

Europe — additions

Some additional dates for the 1980 air show calendar notified since the compilation of the list in last month's issue (page 235).

June

15 FAF Open Day, Orange-Caritat, France
15 FAF Open Day, St Dizier-Robinson, France
24-29 *Salon Aérospatial de Toulouse*, France

August

22-24 *Meeting d'Aviation Bex '80*, Switzerland

September

14 FAF Open Day, Rochefort, France
21 FAF Open Day, Toulouse-Francazal, France

Above: Winner of the prize for the best vintage aircraft at the Wessex Strut fly-in held at Henstridge, Somerset on 13 April 1980, and a visitor to Old Warden on Easter Monday, was Gipsy Moth G-ABEV finished in the same colour scheme as Amy Johnson's famous Moth, G-AAAH *Jason*. *Photo: Roy Bonser*

seems to be getting nearer. Early in April the Duke of Edinburgh made a number of training flights in the BAe demonstrator and two 'unallocated' srs 475s are making progress on the line at Hurn.

Fly-in time

April saw the now traditional early-Spring events in the light aviation calendar. On Easter Sunday David Harper and colleagues of the Vintage Aircraft Club held the Daffodil Rally at Finmere, Bucks. This was well supported both by visiting aircraft and entrants for the various competitions. Amongst the usual collection of Piper and Cessna variants, Jodels and Austers were two notable veterans, Leopard Moth G-ACMN and Stearman G-BAVN. Both gave brief demonstration flights before departing to their home bases. Several of the STOL aircraft tried out the adjacent field as an alternative landing ground to the former RAF airfield.

The Wessex Strut of the PFA has organised the first PFA fly-in of the year at Henstridge, Somerset since 1977 and each year the number of visiting aircraft has grown. 1980 was no exception with a record 152 visitors logged in addition to the six residents and four home-builts in various stages of completion. The weather forecast for 13 April was threatening rain and strong winds yet the day remained warm and sunny throughout, no doubt a factor in producing such a response.

From the first arrivals, Cherokee G-ATVS and Cessna 172 G-ASSS from Bristol shortly before 10.00hr there was a steady stream of aircraft into the circuit; amongst the most interesting were Gipsy Moths N585M and G-ABEV — the latter recently rebuilt by Ron Souch at Southampton — Cessna 120 G-BHLW, Puss Moth G-ABLS, Jungmann G-BEDA, Turbi G-AOTK, EAA G-AVZW, Stagger wing G-BDGK, Provost WV494 (G-BGSB), Geronimo N4422P, RF-7 G-EHAP and RS-180 G-VIZZ. The largest machine to land on the 900m main runway was King Air G-BBVM from Hurn, while the smallest arrival was Hornet Gyroplane G-MIKE which made an epic flight from Cornwall, touching down en route at Dunkeswell to refuel.

The aircraft to receive most attention was the first Rutan Varieze to fly in this country G-LASS from Biggin Hill. Not unexpectedly it carried off the prize for the best home-built visitor to Henstridge. The large crowd of enthusiasts and aircrew were treated to a fine display by the Varieze before it headed home in the afternoon. The prize for the best vintage aircraft went to the Gipsy Moth G-ABEV

which is resplendent in the same colour scheme as Amy Johnson's famous *Jason* G-AAAH now in the Science Museum. Like the Metal Moth N585M it had not previously been registered in this country, having been brought in from Switzerland where it was HB-OKI. The letters G-ABEV were allocated in March 1977, having first been issued to a Blackburn Bluebird but not used by it. The longest flight to Henstridge was made by Emeraude G-AXXC from Tees-side, a previous recipient of this prize.

It was also encouraging to see the progress being made with homebuilts by members of the Wessex Strut who brought their part complete aircraft in by road to display them statically! Essentially complete Cassutt G-BFMF built by Phil Lewis should have flown by the time these words appear. Not far behind is Brian Perkin's Colibri G-BPBP, while Taylor Monoplane G-BGCY and Pietenpol Aircamper G-ECOX have a good deal more work to be done on them. Pride of place amongst the small number of residents was Lockspeiser LDA01 G-AVOR which is in the care of Wessex Strut Secretary Tony Young while David Lockspeiser is in Singapore. Sadly this 1980 Fly-in is likely to be the last at the former RN air station. If the BBC's application to build a short-wave radio transmitter at Henstridge is successful a new venue will have to be found for the 1981 Spring Fly-in.

The first Shuttleworth Flying Day of 1980 was held on Easter Monday at Old Warden. The flying display included the usual selection of residents from the Bristol Fighter and LVG through to the Provost. These were augmented by visiting Wallis WA116 G-ARZB and a Pitts. Unfortunately the Boxkite was unable to fly once again because of the strengthening wind and the Parnall Elf G-AAIN has yet to get into the air after its lengthy rebuild. Included amongst the 70 or so visiting light aircraft were Gipsy Moths G-ABEV and N585M and from overseas CAP20 F-GAUB. The next Flying Day at Old Warden is on Sunday 25 May, which has been entitled 'Another Day of Historic Military Aircraft in the Air'. Items planned for this occasion include the Flycatcher, Ryan PT-22, Sea Hawk and Varsity as well as the Collection's own machines. A unique sight will be the Hawker Hind, which, though not complete, will be wheeled out of the workshops for the benefit of photographers.

Right: The Curator of the *Museu Aeroespacial*, Brazil, Major J. M. Monteiro, has kindly provided this picture of the Museum's beautifully restored Douglas A-20K as a postscript to the article in the September 1979 issue of *Aircraft Illustrated*. As related in the article by Michael Turner, the aircraft has been transformed from a vandalised relic found in a children's playground in 1976 to this masterly example of the restorer's craft. *Photo: Major J. M. Monteiro*

For some of this month's contributions we would like to thank: P. J. Bish, R. Bonser, D. A. Conway, G. Finch, M. Gladwell, J. Guthrie, I. MacFarlane, A. March, E. A. Shackleton, D. Spurgeon, J. A. White and R. Wright. Also the publications *Air North*, *Air Scotland*, *Air Strip*, *Aviation Ireland*, *British Aviation Review*, *Humberside Air Review*, *Irish Air Letter*, *Scottish Air News*, *Skyward* and *South West Aviation News*.

Military Aircraft Markings

First published in March 1980, *Military Aircraft Markings* (Ian Allan, £1.25) sets out to list aircraft currently carrying service serial numbers in the UK. Inevitably there have been changes to the listing since it went to print and to enable readers to keep abreast of these it is proposed to detail reported additions from time to time. Changes of owner, operator or base will not be included. Reader's comments, corrections and further information will be welcomed.

Right: The RAF's first Chinook HC Mk1, ZA670, during its maiden flight at Boeing Vertol's Philadelphia facility on 23 March 1980. *Photo: Boeing Vertol*

Additional serials

K5457	Hawker Hind (BAPC 78)	Shuttleworth Trust
K7271	Hawker Fury II Replica	RAF Cosford Aerospace Museum
L6906	Miles Magister (BAPC 44)	Privately owned, Wroughton
N3788	Miles Magister (G-AKPF)	Privately owned, Bassingbourn
R4959	DH Tiger Moth (G-ARAZ)	Privately owned, Booker
T5493	DH Tiger Moth (G-ANEF	Privately owned, Sywell
T7404	DH Tiger Moth (G-ANMV)	Privately owned, Compton Abbas
Z7258	DH Dragon Rapide (G-AHGD)	Privately owned, Booker
BS676	Pfalzkuku (G-KUKU)	Privately owned, Blackbushe
EM726	DH Tiger Moth (G-ANDE)	Privately owned, Stapleford Tawney
MV370	VS Spitfire XIV	Privately owned, Hemel Hempstead
NH238	VS Spitfire IX (N238V)	Privately owned, Blackbushe
NH749	VS Spitfire XIV	Privately owned, Hemel Hempstead
WG464	DH Chipmunk T10	131 Sqn ATC, Newcastle
WH777	EE Canberra PR7	RAF St Athan store
WH850	EE Canberra T4	RAF St Athan store
WJ581	EE Canberra T17	RAF St Athan store
XD515	DH Vampire T11	SYAPS, Misson
XF545	Percival Provost T1	RAF Linton-on-Ouse, gate
XH583	EE Canberra T4	RAF St Athan store
XK590	DH Vampire T11	West Oxfordshire Tech Coll
XL580	Hawker Hunter T8M	MoD(PE) for RN
XL739	Savo Skeeter AOP12	AAC Detmold, preserved
XM181	BAC Lightning F1A	RAF Binbrook
XM183	BAC Lightning F1A	RAF Binbrook
XM705	HS Gnat T1	RAF Germany, Bruggen
XN133	Sud Alouette AH2	AAC 16 Flight
XN359	WS55 Whirlwind HAR9	RNAY Wroughton, store
XW767	HS Harrier GR3	BAe Bitteswell, rebuild
XW857	Westland Gazelle HT2	RN705 Sqn, RNAS Culdrose
XW859	Westland Gazelle HT2	RN705 Sqn, RNAS Culdrose
XX391	Westland Gazelle HT2	RN705 Sqn, RNAS Culdrose
XZ220	Westland Lynx AH1	AAC BAOR
XZ221	Westland Lynx AH1	AAC BAOR
XZ222	Westland Lynx AH1	AAC BAOR
XZ605	Westland Lynx AH1	AAC BAOR
XZ606	Westland Lynx AH1	AAC BAOR
XZ607	Westland Lynx AH1	AAC BAOR
XZ608	Westland Lynx AH1	AAC BAOR
XZ609	Westland Lynx AH1	AAC BAOR
XZ610	Westland Lynx AH1	AAC BAOR
XZ611	Westland Lynx AH1	AAC BAOR
XZ612	Westland Lynx AH1	AAC BAOR
XZ696	Westland Lynx HAS2	RNAS Yeovilton
XZ697	Westland Lynx HAS2	RNAS Yeovilton
ZA500	Westland Lynx (G-LYNX)	Westland Aircraft, Yeovil
ZA670	BV Chinook HC1	MoD(PE) for RAF

Above: Due to lack of space, we were unable to publish this picture of the newly restored Vampire T11 WZ507/ G-VTII, kindly sent to us by Capt John Turnbull along with his letter 'Re-vamped Vampire' which was featured in 'airmail' in the April issue of *Aircraft Illustrated.*

airmail

Liverpool Airport addenda

Sir,

The interesting article on Liverpool (Speke) Airport in the March issue managed, perhaps through pressure on space, to compress some facts with consequent effects upon its accuracy in certain particulars.

The thrice-weekly Imperial Airways London-Liverpool service carried only about 600 passengers between its introduction in June 1930 and its withdrawal on 20 September — hardly an encouraging start! Midland and Scottish Air *Ferries* (not Services), using an Avro Ten, operated a Hooton-Speke-Dublin (Baldonnel) thrice-weekly service in September 1933. The same airline, this time with an Airspeed Ferry, flew between Liverpool and Birmingham for the duration of the 1934 British Industries Fair, but used only Hooton. On 6 April 1934 the operator's Avro 642 was named *Marchioness of Londonderry* by the Prime Minister at Speke and, three days later, London (Maylands)-Birmingham-Liverpool-Glasgow and Liverpool - Isle of Man-Belfast services commenced. They lasted a little over three months and on 16 July a partial replacement appeared with Hillman Airways' London (Abridge)-Liverpool-Isle of Man - Belfast service. Railway air Services had been operating into Speke since 7 May by the extension northward of its summer Plymouth-Birmingham service and then, in August, came the main RAS route between London and Glasgow. This was, incidentally, flown nearly always by DH86s and not DH89s, and from 1 November was rerouted to fly via Liverpool instead of Birmingham and Manchester.

The KLM service from Amsterdam called at Hull (Doncaster instead from 1936) and terminated at Liverpool. When seen it was almost invariably flown with a Fokker FXII for its first two years. The service began on 1 June 1934 and was suspended for the winter on 6 October. On 14 May 1937 Utility Airways began a four-times daily cross-Mersey ferry service between Hooton and Speke with a Monospar ST12. From the end of June it became a request service, was withdrawn on 1 October and did not reappear. In September of the same year North Eastern Airways extended its Hull-Doncaster-Manchester service to Liverpool, but withdrew it west of Doncaster in February 1938.

On 1 July 1936 Northern and Scottish Airways had taken over operating responsibility for the Irish Sea services of British Airways of which it had become a subsidiary. Some nine months later Railway Air Services took over the routes and then, in the autumn of 1937, came the scheme which brought coalition within Isle of Man Air Services Ltd of the RAS Manx Airway operations (in conjunction with the Isle of Man Steam Packet Co Ltd) and Blackpool and West Coast Air Services Ltd. The latter continued to operate services to Dublin in partnership with Aer Lingus as Irish Sea Airways and the words 'Blackpool and' were subsequently deleted from its title.

During the war years there was more civil activity at Speke than at many airports. Aer Lingus resumed its Dublin service on 28 October 1939 and on 7 May the airline's first DC-3 made its first service flight into Speke. On 20 November 1939 Isle of Man Air Services had restored limited services between the island and Belfast and Liverpool and on 5 May 1940 the Associated Airways Joint Committee was set up with its headquarters at Speke. Next day Railway Air Services, as a member, reopened the Liverpool-Belfast-Glasgow route but this was suspended during the evacuation from France and later restored on 27 June. Still during the war, on 13 November 1944, Railway Air Services restored the Liverpool-London link and became the first airline to operate a civilian service into and out of London since 1940. The Aer Lingus service which had returned from Barton to Speke was suspended for security reasons from 14 April to 8 September. In April 1945 Railway Air Services and Scottish Airways started a Glasgow-Prestwick (for the first six weeks)-Liverpool-London service and then in the postwar period the AAJC was responsible for organising the Saturday night newspaper lift to Dublin which used to produce a variety of aircraft types including very often an Aer Lingus DC-3.

JOHN PARKE
Laleham, Surrey

Squadron reunions

Sir,

I would like to call *all* former members of No 221 Squadron, Coastal and Middle East Commands (Wimpeys) Bircham Newton to Idku and all points between, 1941-45, with a view to a possible reunion at the Victory Club London in the spring of 1981. Please reply in first instance with a SAE envelope to the undersigned (Joe, Ex-Maintenance Flight).

H. N. CRAWSHAW
1 The Linkway,
Sutton, Surrey

RAF Burtonwood

Sir,

In its heyday RAF Burtonwood was the largest military base in the world outside the USA. Covering an area of 1,471 acres, Burtonwood had a 9,000ft runway, was surrounded by 16¾ miles of fencing, contained 18 miles of road, 4¼ miles of railway, 22 warehouses, 13 hangars, 1,045 nissen huts and 579 other buildings.

The history of this massive and important base has never been compiled and I am hoping to publish a fully illustrated book on the subject in the near future. I would like to appeal to your readers for photographs depicting Burtonwood any time during its 40-year history and would also like to hear from some of the people who helped drink some eight million cups of coffee served between 1948 and 1958 with personal memories and stories.

All photographs will be treated with great care and returned immediately after copying and all letters will be answered.

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